

**NEW HAVEN HARBOR
CONNECTICUT
NAVIGATION IMPROVEMENT PROJECT**

**INTEGRATED FEASIBILITY REPORT
AND ENVIRONMENTAL IMPACT STATEMENT**

**SUPPORTING TECHNICAL DOCUMENT #3
AECOM SUPPLEMENTAL SEDIMENT EVALUATION**

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**Final Report:
Supplemental Sampling and Testing in
Support of the New Haven Harbor
Navigation Improvement Project:**

**New Haven Harbor Navigation
Improvement Project
New Haven, Connecticut**

Prepared for



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Acronyms

ARO	Aquatic Resource Organisms, Inc.
AWQC	Ambient Water Quality Criteria
CLDS	Central Long Island Sound Disposal Site
COC	Chain of Custody
CR	CR Environmental
CWA	Clean Water Act
DGPS	Differential Global Positioning System
DM	Dredged Material
EC50	Median Effective Concentration
EPA	U.S. Environmental Protection Agency
ERL	Effects Range Low
ERM	Effects Range Median
ESI	EnviroSystems, Inc.
FNP	Federal Navigation Project
FSP	Field Sampling Plan
HMW	High Molecular Weight
ICP/MS	Inductively Coupled Plasma Mass Spectrometry
LC50	Median Lethal Concentration
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LMW	Low Molecular Weight
MDL	Method Detection Limit
MLLW	Mean Lower Low Water
MPRSA	Marine Protection, Research, and Sanctuaries Act
NAE	U.S. Army Corps of Engineers, New England District
NOAA	National Oceanic and Atmospheric Administration
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PHB	Phil Harrington Bait
PWS	Performance Work Statement
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RIM	Regional Implementation Manual
RL	Reporting Limit
RPD	Relative Percent Difference
SPP	Suspended Particulate Phase
SRM	Standard Reference Material
TOC	Total Organic Carbon
USACE	US Army Corps of Engineers

1. Introduction

The New England District (NAE) of the US Army Corps of Engineers (USACE) is currently preparing a suitability determination to assess disposal options for materials which may be generated during improvement dredging activities proposed at the New Haven Harbor Federal Navigation Project (FNP) located in New Haven, Connecticut. This report summarizes efforts performed by the AECOM Team (comprised of AECOM Technical Services, Inc., Ocean Surveys Inc. [OSI], EnviroSystems, Inc. [ESI], and Alpha Analytical, Inc. [Alpha]) under Delivery Order # W912WJ-18-F-0109 of USACE Contract W912WJ-17-D-0003.

The AECOM Team work scope included provision of logistical support to NAE and laboratory analysis for the generation of pertinent environmental data. Data generated under this task order will be used by NAE to assess the suitability of materials to be dredged from the New Haven Harbor FNP (depicted in Figure 1) for potential beneficial reuse, for unconfined open water disposal at the Central Long Island Sound Disposal Site (CLDS) and/or for disposal in proposed Confined Aqueous Disposal Cells (CAD Cells) located within the harbor. The CLDS and the corresponding reference locations are depicted in Figure 2.

This report summarizes the methodology used for field sampling and laboratory analysis, the results of the testing and the quality assurance/quality control (QA/QC) details regarding the analyses.

1.1 Project Background

USACE NAE is currently preparing a feasibility study for improvements to the New Haven Harbor FNP. Anticipated project components include: deepening and widening the main ship channel, widening the channel bend at Southwest Ledge, straightening the channel bend downstream of the existing turning basin; and relocating and deepening the turning basin. These combined actions would require the mechanical removal of up to 4,500,000 cubic yards of sediment and up to 32,000 cubic yards of rock depending on the selected channel alignment and dimensions. Dredged sediments are expected to be a mix of poorly graded sand and fine grained material within the existing channel profile and adjacent harbor seafloor with glaciofluvial deposits at depth. To the extent practical, suitable dredged material will be beneficially reused for marsh creation, habitat restoration, and/or as cover of historic dredged material disposal mounds at the CLDS. Unsuitable material will be placed in a CAD cell to be located in the inner harbor.

NAE completed a sampling and testing effort during the summer of 2017 in order to characterize the materials to be dredged. NAE later revised the alignment of the proposed channel and turning basin based on the results of ship simulation modeling. In addition, a portion of the material from the inner harbor was determined to be unsuitable for unconfined open water placement, based on the results of suspended particulate phase and whole sediment bioassays. In July 2018, NAE coordinated a supplemental sampling and analysis plan (SAP) to characterize sediment from reaches of the redesigned project that were not previously sampled, to characterize the material that would be dredged during CAD cell construction, and to further define the extent of unsuitable material in the inner harbor.

The supplemental work described in this report was performed in late 2018/early 2019, and included field sampling efforts, evaluation of sediment chemistry, preparation and chemical evaluation of representative elutriates, suspended particulate phase (SPP) toxicity testing, 10-day whole sediment toxicity testing and 28-day bioaccumulation testing with associated tissue analysis on applicable harbor material (i.e. sediments and water) from thirteen FNP locations identified in NAE's Performance Work Statement (PWS) entitled "*Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project New Haven, Connecticut*" dated 25 July 2018. The PWS scope was subsequently issued to AECOM on 21 August 2018 and was further revised by NAE on 11 October, 2018.

In order to further characterize materials to be generated under the proposed FNP improvement dredging project, sediments from thirteen core locations within the New Haven Harbor were collected by NAE in October 2018 to undergo sediment, water and elutriate chemical analysis, and biological testing in accordance with the evaluation requirements set forth in the EPA/ NAE regional protocol "*Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters*" (RIM: U.S. Environmental Protection Agency [EPA]/USACE, 2004). To support these evaluations, NAE collected related site waters in October 2018 and supplemental site waters in November 2018 (to support ammonia-reduced SPP toxicity testing). CLDS Reference Site sediment and waters were collected by AECOM in October 2018.

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Sediment, water, elutriate and tissue samples were analysed for individual metals, Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and pesticides in accordance with reporting limits set forth in the RIM in order to determine the suitability of this material for unconfined open water disposal.

A Work Plan (AECOM, 2018a; included as Appendix A) was prepared by AECOM to guide the field sampling and sample handling efforts, as well as the laboratory analyses for samples collected by both NAE and AECOM (NAE's field sampling efforts were completed under the NAE-generated SAP). Field sampling efforts and laboratory analyses described herein were generally completed in accordance with this project Work Plan. Deviations from the Work Plan are described herein. The Work Plan was prepared in accordance with relevant regulations and standards, as described in Section 1.2, below, and in accordance with project-specific requirements identified by NAE in its "Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project New Haven, Connecticut" PWS.

1.2 Relevant Regulations/Standards

Data for the dredged material suitability evaluations under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the Clean Water Act (CWA) have been collected based on quality standards outlined in *QA/QC Guidance for Sampling and Analysis of Sediments, Water and Tissues for Dredged Material Evaluations* (EPA, 1995). The evaluations have followed guidance provided in the Green Book (EPA/USACE, 1991), the *Inland Testing Manual* (EPA/USACE, 1998), and the RIM (EPA/USACE, 2004).

2. Methods

Field and laboratory methods are detailed in the project Work Plan (AECOM, 2018a; included as Appendix A), which is comprised of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP). Brief summaries of the field and laboratory methods used are included in the following subsections.

The Supplemental New Haven Harbor field work described herein was completed by both USACE NAE personnel and individuals on the AECOM and OSI Field Team (collectively the AECOM Field Team). NAE personnel performed sediment and water sampling efforts within the New Haven Harbor FNP. Field activities undertaken by the AECOM Field Team included collection and transport of sediment and water samples from the CLDS Reference Site, as well as receipt and delivery of NAE-collected sediment and water samples obtained from the New Haven Harbor FNP.

Tasks described in Section 2.1, below, as well as in the accompanying Field Report (AECOM, 2018b; included as Appendix B) focus primarily on activities undertaken by the AECOM Field Team. Sampling techniques employed by NAE personnel, relative to sediment and water collection activities on New Haven Harbor, are addressed under separate cover.

2.1 Field Sampling

Sample locations were established by NAE and are distributed throughout the proposed New Haven Harbor FNP project area, as depicted in Figure. The 2018 sampling locations were chosen to augment data collected in the harbor in 2017 and to reflect the revised, anticipated FNP alignment and CAD cell layout. In addition, the CLDS Reference Site sampling location was selected by NAE. The bulk of the project field sampling efforts occurred in October 2018; specifically, sampling commenced on October 22 and was completed on October 26, 2018. To ensure that the waters used in the program's Optional Task 7.1 ammonia-reduced SPP assays remained within hold times, a discrete sampling event was completed by NAE on November, 14, 2018 for the collection of additional dredge site waters from the New Haven Harbor FNP.

The AECOM Field Team program was divided into five subtasks:

- The AECOM Field Team's collection of sediment and water samples at the CLDS Reference Site on October 23, 2018;
- AECOM's receipt of New Haven Harbor sediment and water samples which were collected by NAE (samples collected by NAE on October 22 through 25, 2018) and received by AECOM on October 23 through 25, 2018;
- AECOM's delivery of samples to the project toxicology laboratory (ESI) on October 24, 2018 and two additional deliveries to ESI on October 25, 2018; and,

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- AECOM's delivery of samples directly to the project chemistry laboratory (Alpha) or to the Alpha courier on October 24 and 25, 2018.
- AECOM arranged for ESI to provide courier service directly to NAE on November 14, 2018 for receipt of the additional New Haven Harbor dredge site waters.

Appropriate volumes of dredge area sediment and water were collected by NAE at each of the thirteen harbor stations for the elutriate and biological testing activities described in the sections below. These samples were subsequently composited by the laboratory into the six project composite samples, as described in the project PWS Table 1.

The AECOM Field Team collected sediment and water samples from the CLDS Reference Site (Figure 2), located at latitude 41.134850 and longitude -72.834690 to further facilitate the evaluation of the dredge area material for potential unconfined open water placement.

CLDS Reference Site samples (sediment/water) were collected by the AECOM Field Team from OSI's sampling platform, the survey vessel *R/V Willing II*. Vessel positioning and the determination of actual sample locations were accomplished utilizing a Differential Global Positioning System (DGPS). The sampling vessel was held on station at the CLDS Reference Site by the vessel captain utilizing real-time navigation software (i.e. Hypack). Attachment 4 of the Field Report (AECOM, 2018b; Appendix B) lists the grab sample positions for each attempt.

The Field Report (AECOM, 2018b) provided in Appendix B provides additional detail regarding field activities, including CLDS Reference Site field observations such as penetration depth, material recovery, visual descriptions and other pertinent observations.

2.1.1 Sediment Collection

Sediments from the New Haven Harbor FNP were collected by NAE using vibracore methodology. These sediment samples were containerized by NAE and transferred to AECOM under chain of custody (COC) at the conclusion of NAE sampling efforts.

CLDS Reference Site sediments were collected by the AECOM Field Team using a modified Van Veen grab sampler as outlined in the project Work Plan. Prior to use, the sediment sample field collection equipment was decontaminated in accordance with the project Work Plan. In addition, equipment blanks were collected on the sediment sampling field collection equipment, in accordance with the project Work Plan.

The New Haven Harbor FNP sediment samples and the CLDS Reference Site sediment samples were transferred to a temperature-controlled refrigerated van unit immediately upon return to the dock and were held at temperature and in accordance with the project Work Plan until delivery to ESI.

2.1.2 Water Collection

Water from the vicinity of the six New Haven Harbor sediment composite locations (dredge site water) was collected by NAE personnel on October 24, 2018 using a pump and tubing system. NAE collected additional New Haven Harbor FNP dredge site waters on November, 14, 2018 in support of the Optional Task 7.1 (ammonia-reduced SPP assays).

Waters from the CLDS Reference Site were collected by the AECOM Field Team on October 23, 2018 using a large volume Niskin bottle as outlined in the Work Plan. Prior to use, the water collection equipment was decontaminated in accordance with the project Work Plan. In addition, Equipment blanks were collected on the water collection equipment, in accordance with the project Work Plan.

Water samples were transferred to the refrigerated van immediately after returning to the dock and held at temperature in accordance with the project Work Plan until delivery to ESI.

2.1.3 Sampling Deviations/Difficulties Encountered

There are two notes of interest relative to the New Haven Harbor / CLDS field sample collection effort:

- During the CLDS Reference Site field sampling operations, sea conditions picked up with larger wave action than was forecast for the day (i.e. approximately 4 foot seas, intermittently). During the water sample collection efforts, the captain and AECOM Field Team determined that it was unsafe and unadvisable to attempt to fill the laboratory glassware with CLDS waters while offshore, due to the wave action. All of the equipment blanks and large volume cube containers had been filled with reference site waters when this decision was made. The CLDS Reference Site laboratory waters, which were collected while at sea, were temporarily containerized in spare large volume cube containers and subsequently transported back to the dock for final containerization into the laboratory-provided glassware. No project work plan deviations were incurred as a result of this change, which was made for Health and Safety reasons. No associated project implications are anticipated.
- The Project Work Plan indicates that *“Samples will be chilled on wet ice while on board the vessel and subsequently transferred to a refrigerated box truck/van daily during field operations. The temperature in the refrigerated vehicle will be regularly monitored to ensure that the storage temperature is maintained at 4° Celsius (C) ±2° C”*. During sample transport, AECOM continuously monitored the conditions aboard the vessel and within the refrigerated van unit as prescribed. In addition, and as a precaution against the potential of malfunctioning refrigeration equipment, AECOM packed the samples with wet-ice during the sample transport to the project toxicology laboratory. During two discrete periods (approximately 20 minutes prior to sample delivery at the project toxicology laboratory on October 25, 2018; and again later that same day), the AECOM transport driver noticed an intermittent malfunction of the refrigerated van’s compressor unit. Upon investigation, the driver determined that the refrigeration compressor was displaying an error code and subsequently notified the AECOM Project Manager, the refrigerated van provider and the NAE Task Manager. Throughout the sample transport operations, and upon sample check-ins at the project toxicology laboratory, AECOM confirmed that cargo area holding temperatures were within or below the Work Plan-prescribed temperature range. Accordingly, and as the samples were also transported on ice, no Project Work Plan “deviation” is noted. Additional details regarding temperatures within the refrigerated van are presented in Appendix B.

Neither of the above items represented a deviation from the approved work plan. As such, no corrective action forms have been prepared. No associated project implications are anticipated as a result of either of the above items.

2.2 Sample Processing and Analysis

The project QAPP provides detailed descriptions of the aqueous and sediment sample handling requirements and the methods used for water column and biological testing. Section B.6 of the QAPP (AECOM, 2018a) summarizes the chemical testing methods used and Section B.7 summarizes the bioassay test methods. Only minor deviations from the QAPP were noted. These minor deviations are discussed in Sections 3 for the biological testing (specifically, in Sections 3.1.2.3, 3.2.2.3, and 3.2.3.4) and in Section 4 for the analytical chemistry. These deviations are not expected to have an impact on the usability of the data for decision making.

The biological and analytical project team included two laboratories:

- EnviroSystems, Inc.. (ESI; Hampton, NH) provided processing facilities and performed SPP analysis, 10-day whole sediment toxicity testing, and 28-day bioaccumulation bioassays; and,
- Alpha Analytical Laboratories (Mansfield, MA) provided sediment, elutriate, and tissue chemistry testing services.

Sediment and water samples were transferred directly from the field to ESI for further processing before subsequent testing commenced. Tissue samples were shipped from ESI to Alpha Analytical Laboratories on December 26, 2018 following the completion of the 28-day bioaccumulation assay. All field to lab transfers (and subsequent lab to lab transfers) were conducted under COC procedures, as specified in the project work plan. COC records are included in the laboratory backup appendices (Appendices C and D), as well as in the Field Report (Appendix B).

2.2.1 Sample Handling

Sample handling and delivery was performed as outlined in the project Work Plan. CLDS Reference Site samples collected by the AECOM Team were stored in labeled, 5-gallon food grade collapsible carboys (water samples) or 3.5-gallon food grade high

density polyethylene pails with locking lids (sediment samples), and kept on wet ice until returning to the dock. All sediment and water samples were securely stored in a locked, refrigerated van (set to $4\pm 2^{\circ}\text{C}$) for the field sample transport effort.

2.2.2 Test Sample Preparation and Compositing

Following the sample compositing scheme outlined in the Work Plan / PWS, sediment composites were prepared by combining equal volumes of the material from the various stations for subsequent testing. The sample compositing scheme is depicted in Table 1. These composite samples were used in the sediment bioassays and to develop elutriate/SPP samples for chemical and toxicological testing. As described in the project PWS, Composite 1 sediment was used in the bulk chemistry, elutriate and SPP analyses; however, as per Table 1 of the PWS, these materials were not subject to the 10-day whole sediment toxicity test or the 28-day bioaccumulation bioassay.

2.2.3 Chemical Sample Analysis

Chemical analysis methods are fully detailed in the project work plan (Appendix A). In some cases, specialized or modified methods were specified to accommodate unique project objectives. A description of the specialized or modified methods is also provided in this section. All laboratory reports for chemical analyses are provided in Appendix C.

Bulk sediment samples were analyzed for total organic carbon (TOC), metals, pesticides, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyl (PCB) congeners in October and November 2018, accordance with Table 5 of the PWS and in accordance with the protocols recommended in Tables 1, 2, and 3 of the New England District RIM document, with appropriate updates to current analytical methods. As discussed in Section 3.2.3, below, the bulk sediment samples were re-analyzed for PCBs in March 2019 (within specified hold times), due to elevated reporting limits encountered during the initial PCB analysis (which were attributable to the sample dilution methodology employed). The project team used EPA SW-846 8270D-SIM /680M for the analysis of PCB congeners. The selected gas chromatography/mass spectrometry (GC/MS) method is generally preferred because it provides more definitive quantitation and identification of the target PCB congeners and is less prone to interferences or mis-identification than the earlier 8082 (gas chromatography/electron capture detector [GC/ECD]) method. Table 2 summarizes the analytes, analytical methods and method detection limits achieved for the bulk sediment chemistry analyses.

2.2.4 Elutriate/Suspended Particulate Phase Sample Preparation and Analysis

New Haven Harbor dredge site water was used in the preparation of all chemical elutriates and formed the basis of all elutriate/SPP sample preparations. Overlying water from the CLDS Reference Site was used for all SPP dilutions in the toxicity tests.

Each elutriate/SPP batch was prepared by adding the homogenized sediment to the site water in a 1:4 volumetric ratio, stirring the mixture for 30 minutes, and then allowing the mixture to settle for an hour. The supernatant was siphoned off prior to chemical and biological evaluations. Chemical samples were also centrifuged as required by the protocol. All samples were stored at or below 4°C when not in use. Elutriate samples were containerized for chemistry analysis (i.e., filtration of metals samples, analysis of metals and (total) organic compounds). Table 3 provides a summary of the elutriate/SPP preparation.

Elutriate samples were analyzed for metals, pesticides, pentachlorophenol, and PCB congeners in accordance with Table 6 of the PWS and in accordance with the protocol recommended in Table 5 of the New England District RIM document, with appropriate updates to current analytical methods. Chelation extraction and acid digestion followed by analysis using an inductively coupled plasma mass spectrometer (ICP/MS) was used for the analysis of the extracted metals except arsenic, selenium, mercury, and hexavalent chromium. Arsenic and selenium were determined using Hydride Generation Quartz Furnace Atomic Absorption Spectrometry; mercury was determined using Cold Vapor Atomic Fluorescence Spectrometry, and the diphenylcarbazide colorimetric procedure described in Standard Methods 3500-Cr D was used to measure chromium 6 (Cr6+). Table 4 summarizes the analytes, analytical methods and method detection limits achieved for the elutriate chemistry analyses.

Water column bioassays were conducted in accordance with the RIM (EPA/USACE, 2004), the Inland Testing Manual (EPA/USACE, 1998) and the project Work Plan (AECOM, 2018a). Test organisms for the water column bioassays included

Americamysis bahia, *Menidia beryllina*, and *Arbacia punctulata*. Table 6 summarizes the test conditions for these bioassays and Table 7 identifies the dates of the SPP testing. The toxicity tests were completed on the six harbor dredge site elutriate samples, as well as on the CLDS Reference Site water sample. SPP testing was started before the 24-hour holding time for SPP solutions. Results and protocol deviations are described in Section 3.1.2.

2.2.4.1 Ammonia-Mitigated SPP Assays

Because the organisms used in suspended phase toxicity testing are sensitive to ammonia, excessive ammonia concentrations may cause a toxic response not of interest to the evaluation, which focuses on persistent contaminants. To account for this potential false positive, the EPA and NAE devised a protocol to determine if ammonia is the driver of toxicity in situations where unionized ammonia is present at concentrations that may cause toxicity. After the SPP assays were initiated, ammonia levels were measured and elevated levels were noted. In accordance with the PWS requirements, NAE was notified of the elevated ammonia within 24 hours. NAE issued an authorization for AECOM to proceed with running the optional ammonia-mitigated SPP assays, in addition to the “standard” SPP assays that were included under the initial scope of work.

Following receipt of authorization from NAE, a second set of “mitigated” assays were established wherein each test sediment composite was purged to reduce the ammonia concentration in the sediment prior to preparing the elutriate samples for a second round of ammonia-reduced SPP biological testing. Sediment purges were set up in accordance with the Work Plan and followed the Ferretti method (Ferretti et al, 2000), which involved loading a portion of each composite sediment sample into clean HDPE vessels to a depth of 7-11 mm and adding clean overlying water (Hampton-Seabrook Estuary water used by the laboratory as control water) in a 1:3 ratio of sediment to water. A thin piece of plastic was placed over the sediment prior to adding the overlying water in an effort to keep the sediment from becoming suspended during the addition. The thin piece of plastic was slowly removed after the overlying water was added. Each mitigation vessel was aerated and the temperature, pH, specific conductivity, salinity and dissolved oxygen were recorded daily prior to siphoning off the overlying water.

A small sub-sample was removed daily from each sediment composite and centrifuged to extract pore water. Temperature, pH and salinity of the extract were recorded and the pore water was subsequently analyzed for total ammonia. These data were used to calculate the pore water unionized ammonia levels daily. When the daily value of any composite was below the target threshold of 0.1 mg/L unionized ammonia (AECOM, 2018a), composites were removed from their mitigation vessels, placed in clean HDPE 1-gallon buckets and refrigerated prior to preparing elutriate solutions for use in “mitigated” assays. Table 5 summarizes the results of the ammonia purging process.

2.2.4.2 Test Species

A. bahia were ≤ 5 days old and were obtained from Aquatic Resource Organisms (ARO) of Hampton, New Hampshire. *M. beryllina* were 9-14 days old at the start of the assay and were also obtained from ARO. Prior to use, test organisms were held for a minimum of 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. Organisms were transferred to test vessels using a large bore pipet to minimize the amount of water added to test solutions.

Adult *A. punctulata* were obtained from ESI, and the original stock was obtained from ARO of Hampton, New Hampshire. Adult sea urchins are maintained in the laboratory for as long as they are viable. Male and female urchins are maintained in separate chambers at a temperature of approximately $12 \pm 3^\circ\text{C}$ after spawning.

2.2.4.3 Reference Toxicant Assays

ESI completed acute ammonium chloride reference toxicant assays for *A. bahia*, *M. beryllina*, and *A. punctulata*. The LC50s for all three species fell within the 95% confidence limits of their respective control charts, indicating that the test organisms were healthy. Table 8 summarizes the results of the reference toxicant assays conducted in support of the SPP assays.

2.2.5 10-Day Whole Sediment Toxicity Testing

Bulk sediment bioassays are an important part of the overall suitability testing framework for open water disposal consideration and agency guidance specifies that a filter feeder, a deposit feeder, and a burrowing organism be represented in the assay. Ten-day whole sediment bioassays were performed using the crustacean *A. bahia* (mysid shrimp) and the crustacean *Leptocheirus*

plumulosus (amphipod) to represent these feeding strategies in accordance with the RIM (EPA/USACE, 2004), the Inland Testing Manual (EPA/USACE, 1998), and the project Work Plan (AECOM, 2018a). *A. bahia* is a filter and deposit feeder that spends much of its time in the water above the sediment-water interface. The amphipod *L. plumulosus* builds burrows in the sediment and feeds on particles that are in suspension and on the sediment surface.

Table 9 summarizes the test conditions for the 10-day whole sediment toxicity tests. Assays with both species began on November 9, 2018 and were terminated on November 19, 2018. The *A. bahia* and *L. plumulosus* assays were successful and met test acceptability criterion for survival. The control sediment used in the *A. bahia* assay was natural sediment collected from the Hampton Estuary, Hampton, New Hampshire. The area is not known to receive any direct industrial inputs and has been used as laboratory reference sediment in the testing of marine sediments for over 30 years. Water from the estuary has been used for the culture and maintenance of test organisms at ESI since 1978. The Hampton Estuary laboratory control was included to verify the health of the test organisms, and as a relative benchmark for reference site toxicity.

Results and protocol deviations are described in Section 3.2.2.

2.2.5.1 Test Species

A. bahia were obtained from Aquatic Research Organisms, Hampton, NH. Prior to use, test organisms were held for 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. *A. bahia* used in the assay were ≤ 5 days old at the start of the test.

L. plumulosus were obtained from cultures maintained by Aquatic Research Organisms, Hampton, NH. Prior to use, test organisms were held for a minimum of 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. *L. plumulosus* were non-reproductive adults.

2.2.5.2 Reference Toxicants

ESI completed acute 96-hour ammonium chloride reference toxicant assays for *A. bahia* and *L. plumulosus*. Results were within two standard deviations of the historic mean of ESI's control charts, indicating that the test organisms were healthy. Table 10 summarizes the results of the reference toxicant assays conducted in support of the 10-day tests. The LC50 for the two species fell within the 95% confidence limits of their respective control charts.

2.2.6 28-Day Bioaccumulation Bioassay and Tissue Analysis

The 28-day solid phase/bioaccumulation evaluation was conducted in accordance with the RIM (EPA/USACE, 2004), the Inland Testing Manual (EPA/USACE, 1998) and the project Work Plan (AECOM, 2018a) using the bivalve *Macoma nasuta* and the burrowing polychaete *Nereis virens*. Table 11 summarizes the test conditions for the 28-day bioaccumulation bioassay.

The *M. nasuta* assays were initiated November 21, 2018 and were completed on December 19, 2018. The *N. virens* assays were initiated on November 20, 2018 and terminated on December 18, 2018. Results and protocol deviations are described in Section 3.2.3.

At the end of the 28-day bioaccumulation assay exposure period and the 24 hour depuration period, the test organisms were recovered, rinsed/depurated with clean seawater, homogenized, frozen and transferred to the chemistry laboratory for preparation and analysis. Tissue samples were analyzed for total lipids, percent moisture, metals, pesticides, PAHs, and PCB congeners. Table 12 summarizes the analytes, analytical methods and method detection limits achieved for the tissue chemistry analyses.

2.2.6.1 Test Species

M. nasuta, approximately 28-45 mm in total length, were obtained from ARO. Organisms were field collected along the Washington coast and shipped to ARO via overnight delivery. At ESI, the clams were placed in clean holding sediment with flowing seawater and monitored for at least 24 hours prior to use. Damaged bivalves and those that would not close when

prodded were discarded. The *Macoma* test commenced on November 21, 2018. A total of 20 organisms were added to each replicate in order to obtain sufficient tissue at test termination.

Adult *N. virens* were also obtained from ARO. Consistent with historic 28-day bioassays, worms were collected in the field (by Phil Harrington Bait [PHB] of Woolwich, ME) primarily from the Damariscotta River watershed, with (with some organism lots potentially sourced by PHB between Portland, ME and Jonesport, ME). Organisms were delivered directly to ARO. If not used the same day, worms were refrigerated overnight in seaweed. Damaged and inactive worms were not used in the assay. The *Nereis* test assay commenced on November 20, 2018 with a total of 20 organisms added to each replicate in order to obtain sufficient tissue at test termination.

2.2.6.2 Reference Toxicant Assays

ESI completed acute 96-hour copper reference toxicant assays for *M. nasuta* and *N. virens* concurrent with the 28-day bioassays. Results were within two standard deviations of the historic mean of ESI's control charts, indicating that the test organisms were healthy. Table 13 summarizes the results of the reference toxicant assays conducted in support of the 28-day bioassays.

2.3 Data Analysis

The array of water column and biological testing that was performed on the New Haven Harbor sediments provides a comprehensive data set from which a suitability assessment for the anticipated unconfined placement of this material at the CLDS may be determined. These data sets were generally evaluated in the following ways:

- Biological testing data were compared to reference or control values;
- Tissue chemistry results for site sediments were compared to the CLDS Reference Site tissue chemistry using non-parametric and t-tests. Additionally, tissue chemistry results for PCB body-burdens from site sediments and CLDS reference sediments were compared to native "pre-test" (i.e., unexposed) tissue chemistry results.

A description of these evaluation methods is provided below.

2.3.1 Toxicity Bioassay Statistics

Survival and effects data were analyzed using statistical software to determine significant differences between the project sediments and the laboratory control, and between project sediments or suspended phase solutions and the agency-selected reference site sediments or solutions. Survival data were evaluated to determine homogeneity of sample variances and normality of distribution. Data sets were subsequently evaluated using the appropriate parametric or non-parametric analysis. Pair-wise comparisons were based on the appropriate statistical analysis presented in the EPA decision tree guidelines specified in individual test methods. Statistical difference was evaluated at $\alpha=0.05$. For the SPP testing, acute exposure endpoints, the median lethal concentration (LC50) and the median effective concentration (EC50; in the *Arbacia* testing), were calculated and responses in the undiluted SPP solutions were evaluated against the responses in the CLDS Reference Site diluent.

2.3.2 Bioaccumulative Tissue Statistics

The statistical analyses of body burden data were completed to determine significant differences between the CLDS reference sediment and each site composite sample. The statistical analyses were completed for all compounds of concern identified in the Work Plan; however, the findings of significance discussed in Section 3.2.3.3 focus only on those compounds detected in the reference sample.

As noted in Section 3.2.3, elevated levels of select PCBs were detected in replicates of the *N. virens* native pre-test tissue. As such, additional comparisons were completed to evaluate the statistical significance of the PCB body-burden observed in the dredge-site composite samples and the CLDS reference site samples versus corresponding levels observed in native pre-test tissue samples.

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Per RIM guidelines and direction provided by the NAE (R.B. Loyd, personal communication, March 26, 2018), one-half the MDL is used in instances when a compound of concern is not detected for purposes of calculating a mean tissue concentration and total concentrations for PAHs, PCBs, and pesticides. MDLs used in statistical computations may be adjusted for differences in tissue mass and final extract volumes used in the analysis for each sample.

Data were evaluated to determine homogeneity of sample variances and normality of distribution using appropriate statistics. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Statistical difference was evaluated at $\alpha = 0.05$.

Table 1 Biological Testing and Elutriate Preparation - Sample Collection Dates and Compositing Information

Station ID	Date	Core Length (ft.) / Water Sample Collection Depth (ft.)	Water Depth (MLLW [ft.])	Latitude ^c	Longitude ^c	Composite ID	SPP/Elutriate testing	10-day toxicity bioassay	28-day bioassay/tissue
Sediment (Composite ID No.)									
Comp V',W' Station V' (1)	10/23/18	6.5	-35.3	41.294036	-72.909534	1	X		
Comp V',W' Station W'(1)	10/23/18	6.7	-33.8	41.293886	-72.907800				
Comp R',S' Station R' (2)	10/23/18	6.0	-36.1	41.291922	-72.908113	2	X	X	X
Comp R',S' Station S' (2)	10/23/18	5.5	-36.5	41.291986	-72.909875				
Comp US-1-2, Station US-1 (3)	10/25/18	6.0	-34.5	41.295935	-72.908823	3	X	X	X
Comp US-1-2, Station US-2 (3)	10/25/18	6.0	-36.2	41.295338	-72.907488				
Comp DS-1-2, Station DS-1 (4)	10/24/18	7.0	-34.9	41.289980	-72.910244	4	X	X	X
Comp DS-1-2, Station DS-2 (4)	10/25/18	7.0	-35.3	41.289660	-72.908568				
Comp TB-1-2, Station TB-1 (5)	10/24/18	7.0	-34.9	41.290108	-72.912034	5	X	X	X
Comp TB-1-2, Station TB-2 (5)	10/24/18	7.0	-35.5	41.291559	-72.911608				
Comp CAD 1-3 Station CAD 1 (6)	10/23/18	5.5	-8.6	41.267155	-72.915131	6	X	X	X
Comp CAD 1-3 Station CAD 2 (6)	10/23/18	5.5	-7.3	41.266472	-72.916295				
Comp CAD 1-3 Station CAD 3 (6)	10/23/18	5.5	-8.3	41.265511	-72.915443	CLDS	X	X	X
NHH-CLDS ^a	10/23/18	1	-78.7	41.134850	-72.834690				
Seawater									
Comp V',W'	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	1	X		
Comp R',S'	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	2	X		
Comp US 1-2	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	3	X		
Comp DS 1-2	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	4	X		
Comp TB 1-2	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	5	X		
Comp CAD 1,2,3	10/24/18	Mid Depth	-25.1	41.278348	-72.913132	6	X		
New Haven ^b	11/14/18	Mid Depth	-1.0	41.269492	-72.931430	All SPP Urchin (Ap.) re-tests			
NHH-CLDS	10/23/18	Mid Depth	-78.7	41.134850	-72.834690	CLDS-Ref	X		
Sediment									

^a Sample collected using grab sampler. Other sediment samples collected using vibracoring device.

^b This water was used only for the repeated *A. punctulata* SPP assay.

^c As-built coordinates are presented herein.

Table 2 Bulk Sediment - Parameters, Analytical Methods, and Method Detection Limits

Parameter	Method Reference	Method Number	MDL	MDL Units
Physical Tests				
Total Solids/Water Content	SM	2540G	0.1	%
Percent Moisture	SM	2540G	0.1	%
TOC	SW-846	9060A	0.01	%
Metals				
Arsenic	SW 846	6020B	0.198	mg/kg
Cadmium	SW 846	6020B	0.079	mg/kg
Chromium	SW 846	6020B	1.41	mg/kg
Copper	SW 846	6020B	0.583	mg/kg
Lead	SW 846	6020B	0.439	mg/kg
Mercury	SW 846	7474	0.004	mg/kg
Nickel	SW 846	6020B	0.803	mg/kg
Zinc	SW 846	6020B	7.82	mg/kg
PAHs				
Acenaphthene	SW-846	8270DSIM	37.4	ug/kg
Acenaphthylene	SW-846	8270DSIM	37.4	ug/kg
Anthracene	SW-846	8270D-SIM	37.4	ug/kg
Benzo(a)anthracene	SW-846	8270DSIM	37.4	ug/kg
Benzo(a)pyrene	SW-846	8270DSIM	37.4	ug/kg
Benzo(b)fluoranthene	SW-846	8270D-SIM	37.4	ug/kg
Benzo(k)fluoranthene	SW-846	8270D-SIM	37.4	ug/kg
Benzo(g,h,i)perylene	SW-846	8270D-SIM	37.4	ug/kg
Chrysene	SW-846	8270D-SIM	37.4	ug/kg
Dibenz(a,h)anthracene	SW-846	8270DSIM	37.4	ug/kg
Fluoranthene	SW-846	8270D-SIM	37.4	ug/kg
Fluorene	SW-846	8270D-SIM	37.4	ug/kg
Indeno(1,2,3-cd)pyrene	SW-846	8270D-SIM	37.4	ug/kg
Naphthalene	SW-846	8270D-SIM	37.4	ug/kg
Phenanthrene	SW-846	8270D-SIM	37.4	ug/kg
Pyrene	SW-846	8270D-SIM	37.4	ug/kg
Pesticides				
Aldrin	SW-846	8081B	0.747	ug/kg
Chlordane – Alpha	SW-846	8081B	0.747	ug/kg
Chlordane – gamma	SW-846	8081B	0.747	ug/kg
Chlordane – oxy	SW-846	8081B	1.49	ug/kg
4,4' – DDT	SW-846	8081B	0.747	ug/kg
4,4' – DDD	SW-846	8081B	0.747	ug/kg
4,4' – DDE	SW-846	8081B	0.747	ug/kg
Dieldrin	SW-846	8081B	0.747	ug/kg
Endosulfan alpha and beta	SW-846	8081B	0.747	ug/kg
Endrin	SW-846	8081B	0.747	ug/kg
Heptachlor and derivative (epoxide)	SW-846	8081B	1.49	ug/kg
Hexachlorocyclohexane (lindane)	SW-846	8081B	0.747	ug/kg
Methoxychlor	SW-846	8081B	2.99	ug/kg
Toxaphene	SW-846	8081B	37.5	ug/kg
trans and cis Nonachlor	SW-846	8081B	0.747	ug/kg
Hexachlorobenzene	SW-846	8081B	1.49	ug/kg
PCBs				
PCB 8	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 18	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 28	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 44	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 49	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 52	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 66	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 87	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 101	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 105	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 118	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 128	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 138	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 153	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 170	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 180	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 183	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg

Table 2 Bulk Sediment - Parameters, Analytical Methods, and Method Detection Limits (Continued)

Parameter	Method Reference	Method Number	MDL	MDL Units
PCB 195	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 206	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg
PCB 209	SW-846/EPA	8270D-SIM/680(M)	0.77	ug/kg

Maximum MDL listed per parameter. MDLs are adjusted to reflect differences in dilutions used in the analysis for each sample.

Table 3 Elutriate Solution Preparation Summary

Water		Sediment		Elutriate Preparation			
Station ID	ESI Code	Composite ID	ESI Code	Elutriate ID	ESI Code	Date	Time
Unmitigated Assays							
Comp V',W'	31242-018	1	31243-100	Composite 1 Elutriate	31246-101	10/25/18	1310
Comp R',S'	31242-022	2	31243-101	Composite 2 Elutriate	31246-103	10/25/18	1405
Comp R',S'	31242-022	2	31243-101	Composite 2 Elutriate	31246-103	10/25/18	1700
Comp US 1-2	31242-014	3	31243-102	Composite 3 Elutriate	31246-105	10/26/18	1615
Comp US 1-2	31242-014	3	31243-102	Composite 3 Elutriate	31246-105	10/26/18	1810
Comp DS 1-2	31242-015	4	31243-103	Composite 4 Elutriate	31246-107	10/26/18	1310
Comp TB 1-2	31242-016	5	31243-104	Composite 5 Elutriate	31246-109	10/26/18	1525
Comp CAD 1,2,3	31242-017	6	31243-105	Composite 6 Elutriate	31246-111	10/25/18	1520
Mitigated Assays							
Comp V',W'	31242-018	1	31243-100	Composite 1 Elutriate	31246-112	10/31/18	1040
Comp R',S'	31242-022	2	31243-101	Composite 2 Elutriate	31246-113	10/31/18	1040
Comp US 1-2	31242-014	3	31243-102	Composite 3 Elutriate	31246-114	10/31/18	1250
Comp DS 1-2	31242-015	4	31243-103	Composite 4 Elutriate	31246-115	10/31/18	1250
Comp TB 1-2	31242-016	5	31243-104	Composite 5 Elutriate	31246-116	10/31/18	1125
Comp CAD 1,2,3	31242-017	6	31243-105	Composite 6 Elutriate	31246-117	10/31/18	1125
Mitigated – A. punctulata repeated assay							
New Haven	31242-021	1	31243-100	Composite 1 Elutriate	31246-118	11/21/18	0900
New Haven	31242-021	2	31243-101	Composite 2 Elutriate	31246-119	11/21/18	0900
New Haven	31242-021	3	31243-102	Composite 3 Elutriate	31246-120	11/21/18	0939
New Haven	31242-021	4	31243-103	Composite 4 Elutriate	31246-121	11/21/18	0939
New Haven	31242-021	5	31243-104	Composite 5 Elutriate	31246-122	11/21/18	1030
New Haven	31242-021	6	31243-105	Composite 6 Elutriate	31246-123	11/21/18	1030

Table 4 Elutriates and Equipment Blank - Parameters, Analytical Methods, and Method Detection Limits

Parameter	Method Reference	Method Number	MDL	MDL Units
Metals				
Arsenic	SW-846	1632A	0.0009	mg/L
Cadmium	SW-846	6020B	0.00001	mg/L
Chromium	SW-846	6020B	0.00003	mg/L
Hexavalent chromium	SW-846	3500-Cr-B	0.003	mg/L
Copper	SW-846	6020B	0.00007	mg/L
Lead	SW-846	6020B	0.00006	mg/L
Mercury	SW-846	7474	0.00001	mg/L
Nickel	SW-846	6020B	0.00011	mg/L
Selenium	SW-846	1632A	0.0009	mg/L
Silver	SW-846	6020B	0.00003	mg/L
Zinc	SW-846	6020B	0.00068	mg/L
Semi-volatile compounds				
Pentachlorophenol	SW-846	8270D	0.464	ug/L
Pesticides				
Aldrin	SW-846	8081B	0.0022	ug/L
Chlordane (alpha/gamma)	SW-846	8081B	0.0005	ug/L
Chloropyrifos	SW-846	8081B	0.0022	ug/L
4,4'-DDT	SW-846	8081B	0.0011	ug/L
Dieldrin	SW-846	8081B	0.0011	ug/L
Endosulfan and derivatives (I, II)	SW-846	8081B	0.0011	ug/L
Endrin	SW-846	8081B	0.0011	ug/L
Heptachlor & derivative (epoxide)	SW-846	8081B	0.0022	ug/L
Hexachlorocyclohexane (lindane)	SW-846	8081B	0.0011	ug/L
Toxaphene	SW-846	8081B	0.0284	ug/L
PCBs				
PCB 8	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 18	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 28	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 44	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 49	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 52	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 66	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 87	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 101	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 105	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 118	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 128	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 138	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 153	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 170	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 180	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 183	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 184	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 187	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 195	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 206	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L
PCB 209	SW-846/EPA	8270D/ 680(M)	0.00114	ug/L

Maximum MDL listed per parameter. MDLs are adjusted to reflect differences in dilutions used in the analysis for each sample.

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Table 5 Summary of Ammonia Mitigation Data

Composite ID	Hour	Date & Time Sampled	Temperature (°C)	pH (SU)	Salinity (‰)	Pore Water Ammonia (mg/L)	
						Total	Unionized
Comp 001 (V', W')	24	10/25/18 1000	18.9	7.46	30	38	0.3361
Comp 001 (V', W')	48	10/26/18 1000	20.0	7.71	30	14	0.2371
Comp 001 (V', W')	72	10/27/18 1350	20.3	7.44	30	15	0.1406
Comp 001 (V', W')	96	10/28/18 1145	17.0	7.43	30	7.8	0.0560
Comp 001 (V', W')	120	10/29/18 1130	19.5	7.37	32	5.2	0.0387
Comp 002 (R', S')	24	10/25/18 1000	18.4	7.59	30	27	0.3095
Comp 002 (R', S')	48	10/26/18 1000	20.0	7.64	30	15	0.2168
Comp 002 (R', S')	72	10/27/18 1350	19.8	7.43	30	16	0.1413
Comp 002 (R', S')	96	10/28/18 1145	17.0	7.37	32	8.4	0.0520
Comp 002 (R', S')	120	10/29/18 1130	19.7	7.39	32	7.3	0.0577
Comp 003 (US-1, US-2)	24	10/27/18 1350	21.0	7.48	30	38	0.4108
Comp 003 (US-1, US-2)	48	10/28/18 1145	18.0	7.38	32	22	0.1499
Comp 003 (US-1, US-2)	72	10/29/18 1130	19.8	7.44	32	14	0.1250
Comp 003 (US-1, US-2)	96	10/30/18 0915	13.8	7.39	32	8	0.0409
Comp 004 (DS-1, DS-2)	24	10/27/18 1350	20.0	7.61	30	31.8	0.4293
Comp 004 (DS-1, DS-2)	48	10/28/18 1145	18.0	7.56	32	15	0.1542
Comp 004 (DS-1, DS-2)	72	10/29/18 1130	19.9	7.51	32	13	0.1372
Comp 004 (DS-1, DS-2)	96	10/30/18 0915	13.5	7.54	32	6.6	0.0465
Comp 005 (TB-1, TB-2)	24	10/25/18 1000	20.0	7.70	30	31	0.5132
Comp 005 (TB-1, TB-2)	48	10/27/18 1350	20.0	7.38	30	18	0.1439
Comp 005 (TB-1, TB-2)	72	10/28/18 1145	18.0	7.39	30	13	0.0917
Comp 005 (TB-1, TB-2)	96	10/29/18 1130	20.0	7.35	32	13	0.0959
Comp 006 (CAD-1, 2 & 3)	24	10/26/18 1000	18.9	7.92	30	12	0.3011
Comp 006 (CAD-1, 2 & 3)	48	10/26/18 1000	20.0	7.62	30	5.5	0.0760
Comp 006 (CAD-1, 2 & 3)	72	10/27/18 1350	20.0	7.63	31	4.2	0.0590
Comp 006 (CAD-1, 2 & 3)	96	10/28/18 1145	19.0	7.55	32	3	0.0325
Comp 006 (CAD-1, 2 & 3)	120	10/29/18 1130	20.0	7.58	32	3	0.0374

Table 6 Suspended Particulate Phase Testing - Testing Conditions

Parameter	<i>A. bahia</i>	<i>M. beryllina</i>	<i>A. punctulata</i>
Treatments (SPP prepared from sediment composites and harbor water)	6 Sample Composites and 1 CLDS Reference Site water	6 Sample Composites and 1 CLDS Reference Site water	6 Sample Composites and 1 CLDS Reference Site water
Replicates	5	5	5
Test population	1-5 days old	7-10 days	2 hours after fertilization
Temperature	Mean of 20 ± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C
Dissolved Oxygen	40% Saturation	40% Saturation	NA
Salinity	25-30 ‰ ±10%	25-30 ‰ ±10%	30 ‰ ±2‰
Feeding	Daily, <24 hour old <i>Artemia nauplii</i>	Daily, <24 hour old <i>Artemia nauplii</i>	None
Reference Toxicant	NH4Cl	NH4Cl	NH4Cl

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Table 7 Suspended Particulate Phase Testing – Period of Assay Conduct

Elutriate		Test Species	Assay Start ^a		Assay End ^a	
Comp/Elutriate ID	ESI Code		Date	Time	Date	Time
Unmitigated Assays						
Composite 1 Elutriate	31246-101	<i>A. bahia</i>	10/25/18	1645	10/29/18	1600
Composite 2 Elutriate	31246-103	<i>M. beryllina</i>	10/25/18	1720	Failed ^b	
			10/26/18	1430	10/30/18	1253
Composite 6 Elutriate	31246-111	<i>A. punctulata</i>	10/25/18	1735	10/29/18	1140
Composite 3 Elutriate	31246-105	<i>A. bahia</i>	10/26/18	1815	10/30/18	1615
Composite 4 Elutriate	31246-107	<i>M. beryllina</i>	10/26/18	1710	10/30/18	1311
Composite 5 Elutriate	31246-109	<i>A. punctulata</i>	10/27/18	1330	10/30/18	1600
Mitigated Assays						
Composite 1 Elutriate Composite 2 Elutriate Composite 3 Elutriate Composite 4 Elutriate Composite 5 Elutriate Composite 6 Elutriate	31246-112	<i>A. bahia</i>	10/25/18	1645	11/04/18	1250
	31246-113	<i>M. beryllina</i>	10/31/18	1605	11/04/18	1325
	31246-114	<i>A. punctulata</i>	10/31/18	1820	Failed ^c	
	31246-115					
	31246-116					
	31246-117					
	31246-118	<i>A. punctulata</i>	11/21/18	1310	11/24/18	0935
31246-119						
31246-120						
31246-121						
31246-122						
31246-123						

^a Start and end times are based on when the controls were started and ended.

^b The failed *M. beryllina* assay was repeated starting on 10/26/18 using the same elutriate samples (within the hold time) and lot of test organisms.

^c The failed *A. punctulata* assay was repeated starting on 11/21/18 using newly prepared elutriate solutions and a new lot of test organisms

Table 8 Suspended Particulate Phase Testing – Reference Toxicant Results

Date	Organism Lot	Endpoint	Value	Historic Mean/ Central Tendency ^a	Acceptable Range ^a	Reference Toxicant
A. bahia						
10/25/18	03AbARO102418	96Hr LC-50	65.6	59.2	35.3 - 84.1	NH4Cl (mg/L)
10/31/18	02AbARO102918	96Hr LC-50	75.5	60.2	35.8 - 84.6	NH4Cl (mg/L)
M. beryllina						
10/25/18	08MbARO102418	96Hr LC-50	46.7	48.8 ^a	16.5 - 81.0 ^a	NH4Cl (mg/L)
10/31/18	08MbARO102918	96Hr LC-50	40.0	46.9	18.4 - 75.5	NH4Cl (mg/L)
A. punctulata						
10/25/18	99ApARO080118	96Hr EC-50	5.9	4.1 ^b	0.0-8.4 ^b	NH4Cl (mg/L)
11/21/18	No data ^c					

^a Values based on the results of 19 assays.

^b Values based on the results of 7 assays

^c Reference toxicant data are not available.

Table 9 10-Day Whole Sediment Testing – Test Conditions

Parameter	<i>L. plumulosus</i>	<i>A. bahia</i>
Treatments	5 Sample Composites and CLDS Reference Site	5 Sample Composites and CLDS Reference Site
Replicates	5	5
Test population	Juvenile -non reproductive adult (3-5 mm)	1-5 days old
Temperature	Mean of 20± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C
Dissolved Oxygen	40% Saturation	40% Saturation
Salinity	20-30‰ ±10%	20-30‰ ±10%
Ammonia	Pore water unionized ammonia <0.8 mg/L	Overlying water unionized ammonia <0.6 mg/L
Feeding	None	Daily, <24 hour old <i>Artemia nauplii</i>
Reference Toxicant	NH4Cl	NH4Cl

Table 10 10-Day Whole Sediment Testing – Reference Toxicant Results

Date	Organism Lot	Endpoint	Value	Historic Mean/ Central Tendency ^a	Acceptable Range ^a	Reference Toxicant
<i>A. bahia</i>						
11/09/18	03AbARO110818	96Hr LC-50	90.8 ^a	62.2	34.6 - 89.8	NH4Cl (mg/L)
<i>L. plumulosus</i>						
11/09/18	19LpARO110818	96Hr LC-50	225.0	183.1 ^b	84.6 - 281.6 ^b	Ammonia (mg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays unless otherwise noted.

^a Normal Acceptance Limits set at ± 2 Std Dev of historic mean; maximum limits are ± 3 Std of historic mean. The ± 3 limit is acceptable, but considered high.

^b Means and acceptable ranges are based on the results of 9 assays.

Table 11 28-Day Bioaccumulation Bioassay – Test Conditions

Parameter	<i>M. nasuta</i>	<i>N. virens</i>
Treatments	5 Sample Composites and CLDS Reference Site	5 Sample Composites and CLDS Reference Site
Replicates	5	5
Test population	Adult clam	Adult Polychaete; 3-15 grams
Temperature	Mean of 12 \pm 2°C Maximum Deviation of 3°C	Mean of 12 \pm 2°C Maximum Deviation of 3°C
Dissolved Oxygen	>40% Saturation	>40% Saturation
Salinity	25-30‰ \pm 10%	25-30‰ \pm 10%
Ammonia	NA (flow through)	NA (flow through)
Feeding	None	None
Reference Toxicant	Copper	Copper

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Table 12 Tissue Analysis - Parameters, Analytical Methods, and Method Detection Limits

Parameter	Method Reference	Method Number	MDL	MDL Units
Physical tests				
Percent Moisture	SM	2540G	0.1	%
Total lipids	NOAA 130, 1998	NOAA TM NOS ORCA 130, 1998	0.1	%
Metals (wet wt.)				
Arsenic	SW-846	6020B	0.0328	mg/kg
Cadmium	SW-846	6020B	0.01	mg/kg
Chromium	SW-846	6020B	0.0343	mg/kg
Copper	SW-846	6020B	0.0318	mg/kg
Lead	SW-846	6020B	0.00554	mg/kg
Mercury	SW-846	7474	0.00344	mg/kg
Nickel	SW-846	6020B	0.0354	mg/kg
Zinc	SW-846	6020B	0.142	mg/kg
PAHs (wet wt.)				
Acenaphthene	SW-846	8270D-SIM	4.95	ug/kg
Acenaphthylene	SW-846	8270D-SIM	4.95	ug/kg
Anthracene	SW-846	8270D-SIM	4.95	ug/kg
Benzo(a)anthracene	SW-846	8270D-SIM	4.95	ug/kg
Benzo(a)pyrene	SW-846	8270D-SIM	4.95	ug/kg
Benzo(b)fluoranthene	SW-846	8270D-SIM	4.95	ug/kg
Benzo(k)fluoranthene	SW-846	8270D-SIM	4.95	ug/kg
Benzo(g,h,i)perylene	SW-846	8270D-SIM)	4.95	ug/kg
Dibenz(a,h)anthracene	SW-846	8270D-SIM)	4.95	ug/kg
Chrysene	SW-846	8270D-SIM	4.95	ug/kg
Fluoranthene	SW-846	8270D-SIM	4.95	ug/kg
Fluorene	SW-846	8270D-SIM	4.95	ug/kg
Indeno(1,2,3-cd)pyrene	SW-846	8270D-SIM	4.95	ug/kg
Naphthalene	SW-846	8270D-SIM	4.95	ug/kg
Phenanthrene	SW-846	8270D-SIM	4.95	ug/kg
Pyrene	SW-846	8270D-SIM	4.95	ug/kg
Pesticides (wet wt)				
Aldrin	SW-846	8081B	0.495	ug/kg
cis-Chlordane	SW-846	8081B	0.495	ug/kg
trans-Chlordane	SW-846	8081B	0.495	ug/kg
cis-Nonachlor	SW-846	8081B	0.495	ug/kg
trans-Nonachlor	SW846	8081B	0.495	ug/kg
Oxychlordane	SW-846	8081B	0.99	ug/kg
Total Chlordanes	SW-846	8081B	0.495	ug/kg
4,4'-DDT	SW-846	8081B	0.495	ug/kg
4,4'-DDD	SW-846	8081B	0.495	ug/kg
4,4'-DDE	SW-846	8081B	0.495	ug/kg
Dieldrin	SW-846	8081B	0.495	ug/kg
alpha-Endosulfan	SW-846	8081B	0.495	ug/kg
Endrin	SW-846	8081B	0.495	ug/kg
Heptachlor	SW-846	8081B	0.495	ug/kg
Heptachlor epoxide	SW-846	8081B	0.99	ug/kg
Hexachlorobenzene	SW-846	8081B	0.99	ug/kg
Lindane	SW-846	8081B	0.495	ug/kg
Methoxychlor	SW-846	8081B	1.98	ug/kg
Toxaphene	SW-846	8081B	24.8	ug/kg

Table 12 Tissue Analysis - Parameters, Analytical Methods, and Method Detection Limits (continued)

Parameter	Method Reference	Method Number	MDL	MDL Units
PCBs (wet wt.)				
PCB 8	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 18	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 28	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 44	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 52	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 66	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 101	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 105	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 118	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 128	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 138	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 153	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 170	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 180	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 187	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 195	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 206	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg
PCB 209	SW-846/EPA	8270D-SIM/680(M)	0.495	ug/kg

Maximum MDL listed per parameter. MDLs are adjusted for differences in tissue mass and final extract volumes used in the analysis for each sample

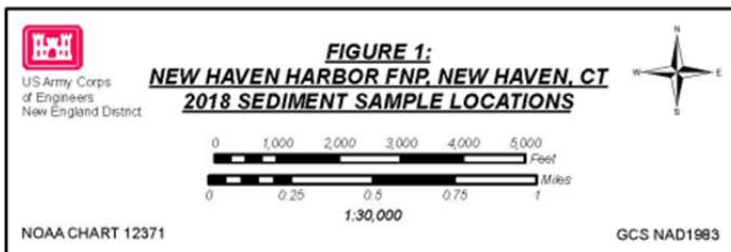
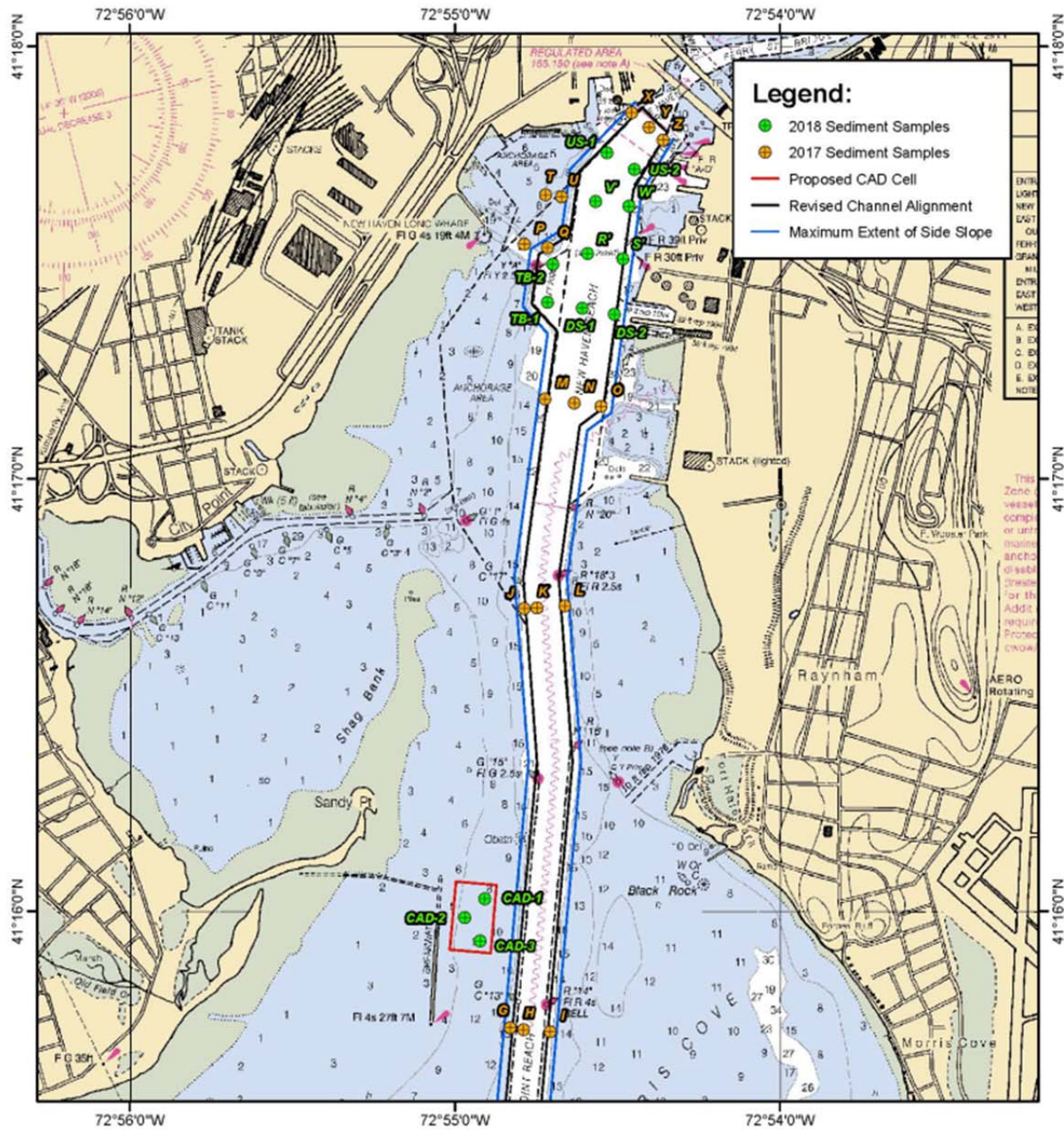
Table 13 28-Day Bioaccumulation Bioassay – Reference Toxicant Results

Date	Organism Lot	Endpoint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>M. nasuta</i>						
11/21/18	99MnARO111318	96Hr LC-50	4.1	8.9	0.5 – 17.4	Copper (mg/L)
<i>N. virens</i>						
11/20/18	99NvARA112018	96Hr LC-50	1.3	3.1	0.5 – 5.7	Copper (mg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays.

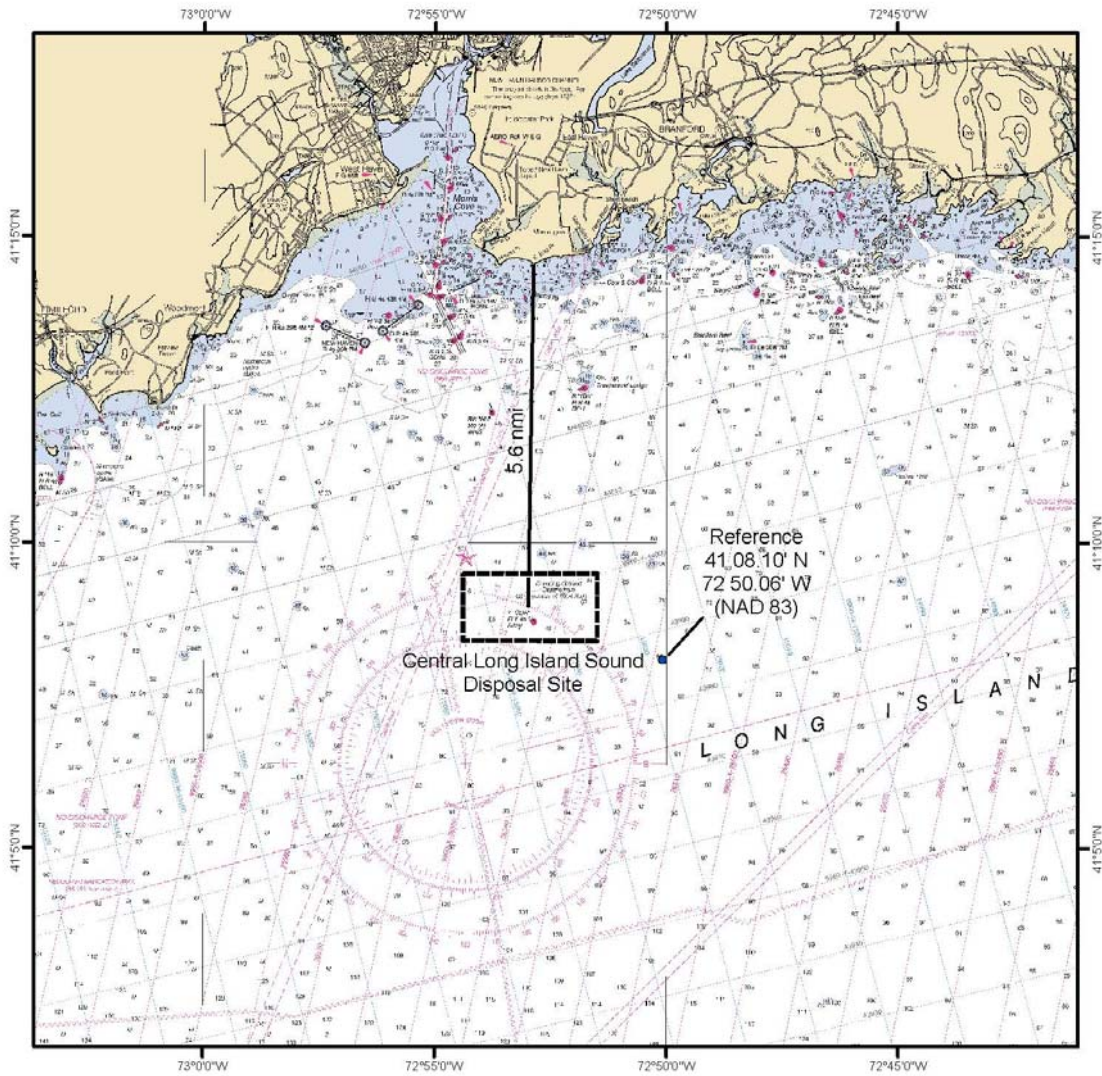
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Figure 1 New Haven Harbor Sediment and Water Sampling Locations [Figure from PWS, NAE 2018]



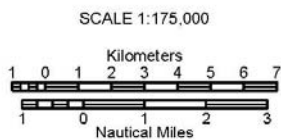
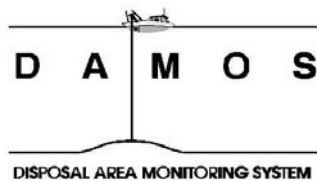
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Figure 2 CLDS Reference Site Sediment and Water Sampling Location (Figure from PWS, NAE 2018)

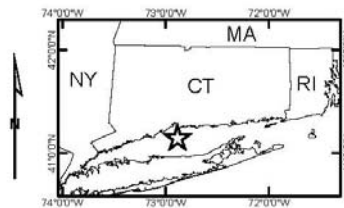


CENTRAL LONG ISLAND SOUND DISPOSAL SITE

Description: The Central Long Island Sound Disposal Site (CLDS) is one of four regional dredged material disposal sites located in the waters of Long Island Sound. CLDS covers a 11.04 km² (3.2 nmi²) area and is centered at 41° 08.950' N, 72° 52.950' W (NAD 83). It is located approximately 10.89 km (5.6 nmi) south of South End Point, East Haven, Connecticut. Since 1977, the management strategy at CLDS has entailed the controlled placement of small to moderate volumes of sediment to form individual disposal mounds on the seafloor. The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents.



NOTE: This chart is not intended for use in navigation.



3. Results and Discussion

The Section 3 subsections present results evaluating the following potential exposure pathways associated with the anticipated unconfined open water material placement at the CLDS:

- Direct exposure to the water column during/after mixing (elutriate and particulate phase analysis);
- Direct exposure to the dredged material (DM) following placement (bulk sediment; chemistry previously analyzed); and,
- Bioaccumulation potential resulting from DM exposure over a period of time (bioaccumulation bioassays followed by tissue analysis).

As described in Section 1, NAE completed a sampling and testing effort during the summer of 2017 in order to characterize the materials to be dredged. NAE later revised the alignment of the proposed channel and turning basin based on the results of ship simulation modeling. In addition, a portion of the material from the inner harbor was determined to be unsuitable for unconfined open water placement, based on the results of suspended particulate phase and whole sediment bioassays. In July 2018, NAE coordinated a supplemental SAP to characterize sediment from reaches of the redesigned project that were not previously sampled, to characterize the material that would be dredged during CAD cell construction, and to further define the extent of unsuitable material in the inner harbor.

The October and November 2018 sampling and analysis efforts described herein include the evaluation of sediment chemistry, elutriate chemistry, SPP toxicity testing, 10-day whole sediment toxicity testing and 28-day bioaccumulation bioassay data with accompanying tissue analysis at sampled stations. This data will be used to form the basis of a suitability determination for unconfined open water disposal at the CLDS, as well as the potential for beneficial reuse (i.e. marsh creation, habitat restoration, cover of historic CLDS disposal mounds).

3.1 Water Column Evaluations

Water column evaluations performed in this study incorporated the analysis of chemical elutriate samples and SPP bioassay tests. The full suite of chemicals were measured in the elutriate mixtures to evaluate possible DM effects on water quality in an open water disposal setting. SPP toxicity bioassays included three test organisms: crustacean, fish, and sea urchin larvae. Acute toxicity as well as sensitive (larvae) developmental effects were evaluated.

3.1.1 Elutriate Chemistry

Table 14 summarizes the elutriate chemistry results obtained after mixing the site materials with reference site seawater to simulate DM mixing at an open water disposal site. Analytical results for the CLDS Reference water are also included in Table 14. Laboratory elutriate chemistry data are included in Appendix C.1.

Pentachlorophenol was below the project reporting limit for all elutriate samples analyzed. In general, metals results were also below project reporting limits in most samples, with the exception of As, Cu, and Zn. There were detects above the project reporting limits for As, Zn, and Cu in six, five, and four elutriate samples, respectively. All detects for pesticides and individual PCB congeners in all elutriate samples were below project reporting limits.

3.1.2 SPP Bioassay Results

Two sets of SPP assays were completed using the unmitigated and mitigated sediment (prepared as described in Section 2.2.4), each with their own paired laboratory control and CLDS reference. Other than the different sediment preparations, assay conduct for both the unmitigated and mitigated sediment was the same. The unmitigated assays were completed in two batches, each with their own paired laboratory control and CLDS reference with elutriate solutions 1, 2 and 6 included in the first batch and elutriate solutions 3, 4 and 5 included in the second batch. The mitigated assays were completed using all six elutriate solutions, one shared laboratory control and one shared CLDS reference for each species.

The SPP endpoints and adverse effects are presented in Table 15. Associated SPP water quality data is presented in Table 16 for the unmitigated assays and Table 17 for the ammonia mitigated assays. Laboratory summary reports, including laboratory bench data, are presented in Appendix D.1.

All SPP laboratory control samples in completed assays met minimum survival criteria. *A. bahia* survival was 100% in the laboratory control and 100% in the CLDS reference water treatment for both batches of unmitigated assays and the single batch of mitigated assays. These *A. bahia* results meet the minimum test acceptability criteria of $\geq 90\%$ survival in the laboratory control and are an indication that the test organisms were healthy and not stressed by handling.

The first batch of *M. beryllina* assays conducted using unmitigated sediment for elutriate solutions 1, 2 and 6 demonstrated poor performance in the laboratory control within 24 hours and that test was terminated and re-started. At the end of the 96 hour exposure period for the unmitigated assays, *M. beryllina* survival was 96% in the laboratory control and 98% in the CLDS reference water treatment for the assays completed on elutriate solutions 1, 2 and 6. *M. beryllina* survival was 90% in the laboratory control and 98% in the CLDS reference water treatment for the unmitigated assays completed on elutriate solutions 3, 4 and 5. For the mitigated assays, *M. beryllina* survival was 90% in the laboratory control and 92% in the CLDS reference water treatment at the end of the 96 hour exposure period. These *M. beryllina* results meet the minimum test acceptability criteria of $\geq 90\%$ survival in the laboratory control and are an indication that the test organisms were healthy and not stressed by handling.

In the *A. punctulata* assays, embryo counts in the laboratory control treatment for the first batch of unmitigated assays showed 78% of the embryos survived at the end of the assay and, of the original embryos, 77% were normally developed pluteus larvae. In the second batch of unmitigated assays, embryo counts in the laboratory control treatment showed 86% of the embryos survived at the end of the assay and, of the original embryos, 85% were normally developed pluteus larvae. In the ammonia reduced assays, embryo counts in the laboratory control treatment showed 76% of the embryos survived at the end of the assay and, of the original embryos, 74% were normally developed pluteus larvae. These results meet the minimum test acceptability criteria of $\geq 70\%$ embryo survival and $\geq 70\%$ normal development in the laboratory control sample.

At the start of the unmitigated assays, total ammonia was observed in the elutriates generated from all six composites (ranging from 12 to 37 mg/L) at the start of the assays for all three test species. Total ammonia levels decreased slightly throughout the life of the unmitigated assays for all three species. Calculated unionized ammonia values from the start of the unmitigated assays for all composites ranged between 0.35 to 0.65 mg/L for all three species. In the ammonia reduced composites, total ammonia ranged from 1.1 to 3.4 mg/L and unionized ammonia ranged from 0.042 to 0.090 mg/L at the start of the assays for all three test species. At the end of the assays, total ammonia in the ammonia reduced composites ranged from 1.2 to 3.7 mg/L.

EPA guidance suggests that ammonia, generally in the unionized form, can be a source of toxicity when total ammonia values are >5 mg/L (EPA 2002). EPA Ambient Water Quality Criteria (AWQC) for unionized ammonia in saltwater references LC50 values for two of the species tested: *A. bahia* (1.04 mg/L) and *M. beryllina* (0.88 mg/L) (EPA, 1989). AWQC for unionized ammonia in saltwater are not available for *A. punctulata*, however, effects levels are available in the literature for urchin species ranging from 0.06 mg/L for an EC50 for development (Maguire Group Inc., 2003) to approximately 0.336 mg/L for a 96-hour LC50 (Chang-Hoon Lee et al., 2013).

Total ammonia concentrations were well above 5 mg/L in all of the unmitigated SPP composites. The calculated unionized ammonia levels for the initial urchin assay were above the literature-based effect levels (0.06 to 0.336 mg/L). The calculated unionized ammonia levels for the unmitigated *A. bahia* and *M. beryllina* SPP assays were below the AWQC LC50s (1.04 mg/L and 0.88 mg/L respectively) in all of the composites.

As described below, survival and development results, particularly for the sea urchin, were improved in the ammonia reduced SPP assays. These results indicate that elevated ammonia levels in the initial SPP assays may have contributed to the observed survival and development impacts.

3.1.2.1 *A. bahia* and *M. beryllina* Acute SPP Evaluations

In the unmitigated assays, mysid shrimp were not adversely affected by exposure to SPP prepared from elutriate solutions 1, 2, 4, and 6 with LC50 values of $>100\%$ for these samples. In SPP solutions prepared from Composite 3 and 5, the LC50 values

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were 74% and 73% respectively. For the ammonia mitigated assays (conducted with elutriate prepared from sediment that was reduced in ammonia), LC50 values were >100% for all six composites.

The first batch of unmitigated *M. beryllina* assays prepared from elutriate solutions 1, 2 and 6 demonstrated poor performance in the laboratory control within 24 hours, therefore that assay was terminated and re-started using the same elutriate sample and lot of test organisms. At the end of the 96 hour exposure period, data generated from the unmitigated assays documented significant negative effects on minnow survival from elutriate solutions 1, 2, 3, 4 and 5. The LC50 values for these elutriate solutions ranged from 56% to 69%. The minnow LC50 was >100% for elutriate solution 6 in the unmitigated assay. For the ammonia mitigated assays, LC50 values were >100% for all six composites.

3.1.2.2 *A. punctulata* Acute SPP Evaluations

Arbacia punctulata is the most sensitive of the project SPP exposed species. Survival and normal development were quantified when it was determined that the majority of the larvae (>90%) in the laboratory controls had reached the pluteus larval stage.

Review of the data collected at the end of the unmitigated assays indicated that SPP assays prepared from all elutriate solutions had negative impacts on embryonic survival and/or development. LC50s and EC50s from SPP solutions prepared from the six composites ranged from 3 to 22% for both survival and development.

For the ammonia mitigated assays, LC50 and EC50 values were >100% for all six composites.

3.1.2.3 SPP Protocol Deviations

Review of the data collected for these assays documented minor deviations from the method protocol and/or ESI's standard procedures, as described below. These lab issues are considered to have had no impact on the outcome of the assays.

Protocol requires, and it is common laboratory procedure, that a reference toxicant assay be completed concurrently with any project assay (at a minimum frequency of once per month). However, the *A. punctulata* assay completed using mitigated sediment does not have an associated reference toxicant assay, and there are no reference toxicant data available for that lot of organisms due in part to the time of year and organism viability. This deviation had no adverse impact on the outcome of the assay as the project assay met all acceptability criteria and there were no impacts on embryonic survival or development in the elutriates.

Protocol requires that the *A. bahia* and *M. beryllina* assays be conducted at $20 \pm 2^\circ\text{C}$ and the *A. punctulata* assay be conducted at $20 \pm 1^\circ\text{C}$. Although the assays were maintained in incubators set at their target temperature, the minimum temperatures recorded during the unmitigated assays for elutriate solutions 3, 4 and 5 fell below the protocol range to a low of 17°C on day 2 of the mysid assay, a low of 14°C on day 2 of the minnow assay and a low of 18°C at the start of the urchin assay. There were no notations on the bench sheets indicating a reason for the low temperatures, therefore the drop below the threshold is likely due to the ambient laboratory temperature at the time that water quality measurements were taken. There was also an isolated exceedance of the upper threshold in the laboratory control of the unmitigated minnow assay for elutriate solutions 1, 2 and 6, which reached a maximum of 23°C on day 0. These species can tolerate temperatures within the ranges measured and this deviation did not adversely affect the outcome of the assay.

In addition, the protocol requires that the assays be conducted at a salinity of 30 ± 2 ‰. It is not uncommon for the salinity to drift upwards during assay conduct due to evaporation and exceed the protocol requirement, but the salinities are adjusted daily as needed to account for this occurrence, except at assay termination. These occurrences at test termination are not considered deviations. In one instance, the salinity in the mysid laboratory control for the mitigated assay for elutriate solutions 3, 4 and 5 was inadvertently overlooked and not adjusted down from 33 ‰ at 72 hours. This was an isolated incident and all other in-life assay measurements >32 ‰ were adjusted accordingly. This deviation did not adversely affect the outcome of the assay.

These lab issues are considered to have had no impact on the outcome of the assays.

3.2 Sediment Chemical and Toxicity Characteristics

Under the current program, bulk sediment chemistry analyses, 10-day whole sediment toxicity testing and 28-day bioaccumulation bioassays with associated tissue analyses were conducted at the proposed FNP stations. These investigations are described in further detail below.

3.2.1 Sediment Chemistry

Table 18 summarizes the results of the bulk sediment chemistry analyses conducted on the 18 samples submitted for analysis. Backup laboratory sediment chemistry data are included in Appendix C.2. In cases where values were below the laboratory reporting limit (RL), the result is considered undetected and qualified with a "U" in the data table.

An overview of findings per parameter is presented below.

3.1.2.1 Metals

Five of the metals analyzed (As, Cr, Cu, Pb, Ni) were present in all sediment samples at levels greater than the project reporting limits. Cadmium was reported as non-detect in 1 of the samples and as estimated values in 5 of the 18 samples; all at concentrations above the project reporting limit. Zinc was reported in one sample as an estimated value above the project reporting limit. Mercury was reported as non-detect in 2 of the 18 samples and was reported as an estimated value between the method detection limit (MDL) and RL in 2 samples.

3.1.2.2 Polycyclic Aromatic Hydrocarbons (PAHs)

PAH compounds were detected in all 18 samples (Table 18). In all samples, concentrations of high molecular weight (HMW) PAHs were greater than the concentrations of the low molecular weight (LMW) PAHs. The highest concentration of HMW PAHs (6,494 µg/kg) was measured at location W' and the highest concentration of LMW PAHs (1,662 µg/kg) was measured at location DS-2.

3.1.2.3 Pesticides

Pesticides were undetected in 4 of the 18 samples. 4,4' DDE, 4,4' DDD, 4,4' DDT, Endosulfan II, Oxychlordane and trans-Chlordane were the most frequently detected pesticides. Cis-Chlordane, cis-Nonachlor, gamma-BHC, Methoxychlor, and trans-Nonachlor were also detected in several of the samples. Toxaphene was not detected in any of the samples; several samples were reported as non-detects at levels above the project reporting limit.

3.1.2.4 Polychlorinated Biphenyls (PCBs)

Measurable concentrations of PCB congeners were reported in 13 of the 18 samples (Table 18). The highest concentration of Total PCBs (222 µg/kg) was measured at location DS-2 0-7.0. Several samples had non-detected PCB congeners at levels above the project reporting limits.

3.2.2 10-Day Whole Sediment Toxicity Testing

A summary of survival data from the 10-day *A. bahia* and *L. plumulosus* assays is included in Table 19. Supporting data, including copies of bench sheets, are included in Appendix D.2. Table 20 summarizes the laboratory control results and other assay acceptability criteria for the 10-day assays. Tables 21 and 22 present the water quality data for *A. bahia* and *L. plumulosus*, respectively, as measured during the 10-day bioassays. Overlying water quality data is presented for *A. bahia* and overlying and pore water quality data is presented for the *L. plumulosus* assays.

Tests were initiated with sediments that were submitted to the ammonia mitigation process (described in Section 2.2.4). This mitigation process ensured that the unionized ammonia levels in the sediment pore waters were less than 0.8 mg/L prior to test initiation. Once the pore waters were below the unionized ammonia threshold for a 24-hour period, composites were removed from their mitigation vessels and placed in clean HDPE 1-gallon buckets until all samples were ready to be loaded into test

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chambers for assay initiation. Test chambers were loaded 24-hours prior to assay initiation to allow sediments and overlying water time to settle.

For the *A. bahia* assay, test organisms were added to the test vessels on November 9, 2018. On November 9, 2018, unionized ammonia samples were collected from the overlying water and concentrations ranged from <0.0022 to 0.0684 mg/L. These levels are below the 0.6 mg/L unionized ammonia overlying water threshold for *A. bahia* test initiation.

For the *L. plumulosus* assay, unionized pore water ammonia levels in the composites were measured one day prior to the addition of test organisms and ranged from 0.1974 to 0.5615 mg/L. These levels were below the 0.8 mg/L unionized ammonia pore water threshold for *L. plumulosus* test initiation so organisms were added the following day (November 9, 2018). On November 9, 2018, unionized ammonia concentrations in the pore water ranged from <0.0104 to 0.2467 mg/L.

3.2.2.1 *A. bahia* 10-Day Solid Phase Assay

Mean mysid survival in the laboratory control sediment was 98%, and met acceptance criteria (e.g. mean survival $\geq 90\%$; $\geq 70\%$ in any replicate). Mean survival in the CLDS reference sediment was 63%. Mean survival of mysid shrimp exposed to the six New Haven Harbor sediment composites ranged from 91% (Composites 3 and 4) to 96% (Composite 6). The statistical analyses show that there were no negative effects on survival for mysids exposed to site composite samples as compared to mysids exposed to the CLDS reference sediment.

3.2.2.2 *L. plumulosus* 10-day solid phase assay

Mean amphipod survival in the laboratory control was 98% and met acceptance criteria. Mean amphipod survival among organisms exposed to CLDS reference sediment was 79%. Mean amphipod exposed to the six New Haven Harbor sediment composites ranged from 92% (Composite 4) to 99% (Composite 5), and the statistical analyses show that there were no negative effects on survival for amphipods exposed to site composite samples as compared to amphipods exposed to the CLDS reference sediments.

3.2.2.3 Whole Sediment Protocol Deviations

Review of the data collected for these assays documented a few minor deviations from the method protocol and/or ESI's standard procedures.

The CLDS reference sediment performed poorly in both the mysid and amphipod assays, achieving only 63% and 79% survival, respectively. The laboratory control and site composites achieved $\geq 90\%$ survival for both species, indicating that organisms were healthy. None of the site composites were determined to be significantly impacted as compared with the reference sediment, given this performance. Test parameters were largely within their targeted ranges, except as noted, and there were no indications that there were any issues with assay conduct. The calculated unionized ammonia levels for the CLDS reference were well below the threshold of 0.8 mg/L in both the pre-assay pore water sample and during assay conduct. There were some juvenile polychaetes found in replicates D and E of the CLDS reference sediment upon recovery of the amphipod assay. It cannot be determined if their presence adversely impacted amphipod survival in those replicates; however, it is plausible that they were a stressor. All test sediments are sieved prior to use and any native organisms present in the reference sediment would have been small enough to pass through this process. Predation within these replicates is possible, but the size of the polychaetes makes it unlikely. Furthermore, none of these polychaetes were recovered from the mysid reference sediment. Although there are no related criteria that the reference sediment must meet, this is considered an out of control event and remains an uncertainty.

Protocol requires that the *A. bahia* and *L. plumulosus* assays be conducted at $30 \pm 2\text{‰}$ and $20 \pm 2\text{‰}$, respectively. Salinity values recorded on day 9 of the *A. bahia* assay and day 10 of both assays fell below their acceptable ranges: to as low as 24.6‰ (*A. bahia*) and 17.2‰ (*L. plumulosus*). The analyst indicated that low readings were experienced with one of the salinity probes and it was subsequently recalibrated. Following recalibration, salinity measurements were generally within range; however, the out of range salinity readings for this project were not able to be recaptured and, as such, may be considered suspect readings. Salinity readings were also encountered on days 3 (*L. plumulosus*) and 7 (both species) that sporadically exceeded the target range; however, these are isolated instances of exceedance and not believed to be related to systemic causes. Mean salinity for

the assays (28.3‰ for *A. bahia* and 19.3‰ for *L. plumulosus*) were within their target ranges and the control survival met acceptance criteria demonstrating that the test organisms are tolerant of salinities within the ranges measured.

The dissolved oxygen in the *L. plumulosus* assay temporarily dropped to a low of 4.9 mg/L, which is below the threshold outlined in ESI's standard operating procedures, however the minimum percent dissolved oxygen (62%) remained above the RIM's threshold of ≥40%. This was an isolated excursion that occurred in the surrogate vessel of the laboratory control on Day 1, which may have been caused if an airline fell out of the test vessel and was subsequently replaced upon discovery.

These lab issues are considered to have had no impact on the outcome of the assays.

3.2.3 28-Day Bioaccumulation Bioassay and Tissue Analysis

To evaluate the bioaccumulation potential of dredged sediments, the clam *Macoma nasuta* and the worm *Nereis virens* were exposed to material from five of the sediment composites. Table 23 provides a summary of the *M. nasuta* and *N. virens* survival data. Table 24 summarizes the laboratory control results and other assay acceptability criteria. Tissue chemistry data and statistical results (relative to reference) are summarized in Table 25 and Table 26. As described in Section 3.2.3.3, additional statistical comparisons were conducted to evaluate PCB body-burdens in the five sediment composites and the CLDS reference site relative to the native pre-test tissue samples for *N. virens*. These results are also summarized in Table 26. Laboratory bench sheets and statistical support are included in Appendix D.3.

3.2.3.1 Survival Analysis

Mean *M. nasuta* survival was 99% for clams maintained the laboratory control and for clams exposed to the CLDS reference sediment. Mean percent survival of the bivalves exposed to harbor sediment composites ranged from 94% to 100%. The statistical evaluation of the survival data showed no significant reduction in survival for bivalves maintained in the site composites when compared to the CLDS reference sediment.

Mean *N. virens* survival was 99% in the laboratory control and 98% in the CLDS reference sediment. Mean percent survival among polychaetes exposed to harbor sediment composites ranged from 93% to 97%. The statistical evaluation of the data showed a significant reduction in survival for polychaetes maintained in Composite 5 sediment when compared to the CLDS reference sediment, however the difference in survival was <10%.

Survival of clams and worms met the established guideline criteria. Surviving organisms for both species tested provided sufficient tissue for preparation and analysis of body burdens.

3.2.3.2 Tissue Chemistry

Test organism tissues were analyzed for the full set of chemical parameters established for the program (AECOM, 2018a) to evaluate the bioaccumulative aspect of the project material. The chemical results provided in Table 25 (*M. nasuta*) and Table 26 (*N. virens*) are presented on a wet weight basis. Backup laboratory tissue chemistry data are included in Appendix C.3. Statistical comparisons of tissue body burdens are discussed in Section 2.3.2.

Review of *M. nasuta* tissue data documented that arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected in *M. nasuta* tissues from all five composites and reference samples. PAHs were also detected above the MDL throughout the five composite samples and in the reference samples. Eleven of the PCB congeners were detected above the MDL at least once among the five composites. Composites 5 and 6 had fewer detections of PCB congeners and lower concentrations of the detected congeners than Composites 2, 3, and 4. PCB congeners were not detected in the CLDS Reference samples. Chlordanes (cis, trans, and oxy) and 4,4'-DDE were each detected above the MDL at least once among the five composites. 4,4'-DDE was the only pesticide detected in the CLDS Reference samples.

Review of *N. virens* tissue data documented that arsenic, cadmium, chromium, copper, lead, nickel, and zinc were detected in *N. virens* tissues from all five composites and reference samples. Mercury was detected above the MDL in Composites 3, 4, 5, and 6 but not in Composite 1 or the CLDS Reference samples. Fluoranthene and pyrene were the only PAHs detect in *N. virens* tissues. Fluoranthene and pyrene were detected in samples from Composites 2, 3, 4, and 6. PAHs were not detected in samples

from Composite 5 or the CLDS Reference. Eight of the PCB congeners were detected above the MDL at least once among the five composites. Four PCB congeners were also detected in the CLDS Reference samples. Twelve pesticides were detected in Composite 4, particularly in the replicate 2 sample. In the remaining composites, 4,4'-DDT was detected in one replicate from Composite 2 and 4,4'-DDE was detected in one replicate from Composite 3.

3.2.3.3 Tissue Body Burden Analysis

Review of *M. nasuta* tissue data document statistically significant increases in body burdens for clams maintained in the project composite sediments for two metals (cadmium in Composite 2 and lead in Composite 6), six PAHs (in multiple composites) and 4,4'-DDE (in Composites 2, 3, and 4) as compared to CLDS Reference tissue. Most notably, the PAHs primarily in Composites 2, 3, 4 and 6 tissues were detected at concentrations 5 to 16 times higher than in CLDS Reference tissue, especially fluoranthene in Composites 3, 4 and 6, and chrysene and pyrene in Composite 6 tissue, which were also detected at concentrations an order of magnitude or more greater than in reference tissue.

Review of the native pre-test clam tissue data indicates that the site composite concentration of cadmium, lead and 4,4'-DDE were only slightly higher than in native tissue, suggesting that the findings of significance may be attributable to background levels of these compounds in the native clam tissue. The same is true for five of the six PAHs detected in Composite 5 tissue. Concentrations of chemicals in native pre-test *Macoma* tissue were generally similar to or below the CLDS Reference tissues.

Review of body burden data also showed that the following chemicals of concern were detected in *M. nasuta* tissue following exposure to site composite sediment but were not detected in CLDS Reference tissue, therefore these COCs were eliminated from further evaluation: six PAHs (acenaphthene, anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene), ten PCB congeners (8, 18, 28, 44, 52, 66, 101, 118, 138 and 153), and six pesticides (4,4'-DDD, 4,4'-DDT, alpha-chlordane, gamma-chlordane, dieldrin and oxychlordane).

The review of *N. virens* tissue data found that there were significant increases in body burdens for worms maintained in the project composite sediments for one metal (copper in Composite 6) and five PCB congeners (138, 153, 170, 180 and 187 in multiple composites), compared to CLDS Reference tissue.

Review of the native pre-test worm tissue data indicates that the site composite tissue concentrations of PCB congeners 138 and 170 were approximately equal to or less than concentrations found in native tissue, and site composite tissue concentrations of copper and PCB congeners 153, 180 and 187 were only slightly higher than in native tissue, indicating that the findings of significance may be attributable to levels occurring in worm tissue prior to testing. The concentrations of several PCB congeners in the native tissues were higher than in the CLDS Reference or composite tissue samples and these levels triggered a review of the native tissue PCB data and performance of additional statistical evaluations. This supplemental review is discussed in Section 3.2.3.3.1.

Review of body burden data also showed that the following chemicals of concern were detected in worm tissue following exposure to site composite sediment but were not detected in CLDS reference tissue, therefore these COCs were eliminated from further evaluation: mercury, two PAHs (fluoranthene and pyrene), seven PCB congeners (8, 18, 52, 101, 105, 128 and 195), and 14 pesticides (4,4'-DDE, 4,4'-DDT, aldrin, cis-nonachlor, alpha-chlordane, gamma-chlordane, dieldrin, endosulfan I, endosulfan II, gamma-BHC, heptachlor, heptachlor epoxide, hexachlorobenzene and oxychlordane).

3.2.3.3.1 *N. virens* Supplemental PCB Data Review

As discussed above, PCB congeners were detected in native pre-test *N. virens* samples. As indicated in Table 26, mean concentrations of some congeners in the native tissues were higher than those detected in the CLDS Reference or composite tissue samples. In some cases, congeners in Composites 2, 4, and 5 were statistically higher than the CLDS Reference sample results, but concentrations were lower than the native tissue result.

Therefore, additional statistics were conducted to assess whether CLDS Reference and site composite concentrations were statistically significantly higher than the native pre-test concentrations. PCB congener 52 in Composites 2 and 4 were the only congeners in the exposed treatments (CLDS Reference or site composites) that were statistically higher than in the native tissues. None of the congeners in Composites 2, 4, or 5 that were statistically greater than the CLDS reference site tissue were

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statistically above the native tissue concentrations. These results show that there are generally similar concentrations of these congeners (i.e., 138, 153, 170, 180 and 187) among Composites 2, 4, and 5 native tissues.

An additional set of statistics presented in Table 26 also shows that for several congeners, concentrations in the native tissues are statistically greater than in the exposed site sediments or the CLDS Reference sediments. These supplemental statistical comparisons support the observation that the original findings of significance relative to the CLDS Reference results, may be attributable to PCB levels occurring in worm tissue prior to testing.

A review of the sediment PCB data presented in Table 18 was also conducted. In accordance with the Work Plan, sediments (representing multiple individual samples depicted on Table 18) were combined in equal parts to generate the tested composites. As such, the averages of these samples approximate the PCB concentrations for the tested sediment in the *N. virens* assays. The estimated Total PCB concentrations for the tested composites are listed below:

- Composite 2 - 82 ug/kg
- Composite 3 - 50 ug/kg
- Composite 4 - 166 ug/kg
- Composite 5 - 32 ug/kg
- Composite 6 - 18 ug/kg

Concentrations of Total PCBs in Composites 2, 3, 4, and 5 are all between the Effects Range Low (ERL) and Effects Range Median (ERM) sediment benchmarks of 23 and 180 ug/kg, respectively (Buchman, 2008) and concentrations in Composite 6 are below the ERL. None of the concentrations were above the ERM at a level where adverse effects on the benthic community would be likely.

This supplemental review of PCB data indicates that the native pre-test *N. virens* tissues contained elevated levels of some PCB congeners. The statistical finding of significance, relative to the CLDS Reference, for PCB 138, 153, 170, 180 and 187 in some tested Composites appears to be influenced by the concentrations in the native tissues. None of the congeners were statistically higher than both the CLDS Reference and the native tissues.

3.2.3.4 28-Day Bioaccumulation Bioassay and Tissue Protocol Deviations

Review of the data collected for these assays documented minor deviations from the method protocol and/or ESI's standard procedures.

Data from daily temperature readings suggests that temperatures were generally on the low end of the acceptable range as the mean temperature of 11.4°C for the *N. virens* assay falls below the targeted limit of 14±2°C and the mean temperature of 11.6°C for the *M. nasuta* assay only meets the criterion by rounding to the precision reflected in the protocol. The mean temperature of 12.0°C calculated from the hourly data logger readings is within the acceptable range. Although slightly low, the daily temperature values are still within the normal temperature range tolerated by these species. It is the opinion of ESI's technical manager that this deviation had no adverse impact on the results of the assays.

Data from the daily salinity readings indicates that the minimum measurements fell outside of the acceptable range for both species. The excursions all occurred on November 28, 2018 (day 7 of the *M. nasuta* assay and day 8 of the *N. virens* assay) and were all within the 25-27‰ range, except for one measurement of 13.3‰ in replicate E of composite 5 for *N. virens* that is likely an erroneous reading resulting from technician error. While the exact reason for the excursions is unclear, this deviation did not adversely affect the outcome of the assay.

The temperature logger for collecting hourly data was not activated at the start of the assays, but instead was activated on November 30, 2018 (day 9 of the *M. nasuta* assay and day 10 of the *N. virens* assay). As a result, approximately one-quarter of the hourly temperature readings were not recorded. In addition, daily water quality readings are missing for replicate A of composite 6 on day 0 of the *N. virens* assay due to a multi-probe malfunction; however, water quality readings were obtained from replicates B, C, D and E for that same composite, and all measurements appear to be within reasonable proximity to each other and to the measurements collected for the other composites that day. While these deviations represent a data gap, this deviation did not adversely affect the outcome of the assay.

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As described in Section 3.2.3.2, native pre-test PCB concentrations in *N. virens* were elevated and greater than historic concentrations of PCBs noted in source organisms. The *Inland Testing Manual* (EPA/USACE, 1998) specifies that the background levels of contaminants in time-zero tissues should not be “inordinate”. In order to address the potential influence of the background PCB levels noted in exposed test organisms, additional statistical comparisons were performed as described in Section 3.2.3.3.1.

Table 14 Elutriate Chemistry Results

Analyte	NHH-CLDS	Composite 1	Composite 2	Composite 3	Composite 4	Composite 5	Composite 6
Total Metals (mg/L)							
Arsenic, Total	0.00066	0.0394	0.038677	0.02935	0.03803	0.03354	0.02174
Selenium, Total	0.00056 U	0.00029	0.00031	0.00018	0.00023	0.00020	0.00014
Chromium, Hexavalent	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cadmium, Total	0.00008	0.00003	0.00003	0.00002	0.00003	0.00004 U	0.00004 U
Chromium, Total	0.00019	0.00039	0.00092	0.00109	0.00069	0.00035	0.00031
Copper, Total	0.00085	0.00077	0.00131	0.00053	0.00124	0.00027	0.00099
Lead, Total	0.00073	0.00052	0.00107	0.00041	0.00100	0.00020	0.00044
Nickel, Total	0.0007	0.00056	0.00061	0.00039	0.00044	0.00025	0.00035
Silver, Total	0.00011	0.00008 U	0.00007	0.00008 U	0.00006	0.00006	0.00008 U
Zinc, Total	0.0014 J	0.00157	0.00219	0.00129	0.00225	0.002 U	0.00126
Mercury, Total	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U
Organochlorine Pesticides (ug/L)							
4,4-DDT	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0011 U	0.0004 U	0.0005 U
Aldrin	0.001 U	0.001 U	0.001 U	0.0010 U	0.0014 U	0.0009 U	0.001 U
Chloropyrifos	0.001 U	0.001 U	0.001 U	0.0010 U	0.0014 U	0.0009 U	0.001 U
cis-Chlordane	0.0005 U	0.0007	0.0007	0.0041	0.0041	0.0011	0.0005 U
Dieldrin	0.0005 U	0.0011	0.0011	0.0007	0.0012	0.0004 U	0.0014
Endosulfan I	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0009	0.0004 U	0.0005 U
Endosulfan II	0.0005 U	0.0009	0.0015	0.0025	0.0030	0.0011	0.0005 U
Endrin	0.0005 U	0.0005 U	0.0020	0.0005 U	0.0007 U	0.0004 U	0.0005
gamma-BHC	0.0005 U	0.0028	0.0023	0.0005 U	0.0007 U	0.0004 U	0.0025
Heptachlor	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0007 U	0.0004 U	0.0005 U
Heptachlor epoxide	0.001 U	0.001 U	0.001 U	0.001 U	0.0014 U	0.0009 U	0.001 U
Toxaphene	0.0263 U	0.025 U	0.0257 U	0.0251 U	0.0359 U	0.0247 U	0.0256 U
trans-Chlordane	0.0005 U	0.0010	0.0019	0.0005 U	0.0024	0.0008	0.0010
Pentachlorophenol (ug/L)							
Pentachlorophenol	2.1 U	2.06 U	2.09 U	1.97 U	1.99 U	1.99 U	2.05 U
Polychlorinated Biphenyl Congeners (ug/L)							
PCB 8	0.0011 U	0.001 U	0.001 U	0.00100 U	0.00144 U	0.00099 U	0.001 U
PCB 18	0.0011 U	0.001 U	0.001	0.00111	0.00165	0.00099 U	0.001 U
PCB 28	0.0011 U	0.002	0.001	0.00097	0.00225	0.00099 U	0.001 U
PCB 44	0.0011 U	0.001	0.001	0.00100 U	0.00260	0.00099 U	0.001 U
PCB 49	x 0.0011 U	0.001	0.001 U	0.00142	0.00287	0.00099 U	0.001 U
PCB 52	0.0011 U	0.001	0.001	0.00239	0.00527	0.00079	0.001 U
PCB 66	0.0011 U	0.001	0.001 U	0.00124	0.00266	0.00099 U	0.001 U
PCB 87	x 0.0011 U	0.001 U	0.001 U	0.00100	0.00198	0.00099 U	0.001 U
PCB 101	0.0011 U	0.001	0.001 U	0.00178	0.00440	0.00056	0.001 U
PCB 105	0.0011 U	0.001	0.001	0.00100 U	0.00140	0.00099 U	0.001 U
PCB 118	0.0011 U	0.001	0.001 U	0.00157	0.00433	0.00080	0.001 U
PCB 128	0.0011 U	0.001 U	0.001 U	0.00100 U	0.00144 U	0.00099 U	0.001 U
PCB 138	0.0011 U	0.001	0.001	0.00185	0.00510	0.00066	0.001 U
PCB 153	0.0011 U	0.001	0.001 U	0.00159	0.00514	0.00066	0.001 U
PCB 170	0.0011 U	0.001 U	0.001 U	0.00090	0.00227	0.00099 U	0.001 U
PCB 180	0.0011 U	0.001	0.001 U	0.00138	0.00355	0.00087	0.001 U
PCB 183	x 0.0011 U	0.001 U	0.001 U	0.00085	0.00175	0.00099 U	0.001 U
PCB 184	x 0.0011 U	0.001 U	0.001 U	0.00100 U	0.00144 U	0.00099 U	0.001 U
PCB 187	0.0011 U	0.001 U	0.001 U	0.00115	0.00245	0.00099 U	0.001 U
PCB 195	0.0011 U	0.001 U	0.001 U	0.00100 U	0.00143	0.00099 U	0.001 U
PCB 206	0.0011 U	0.001 U	0.001 U	0.00088	0.00163	0.00099 U	0.001 U
PCB 209	0.0011 U	0.001 U	0.001 U	0.00100 U	0.00128	0.00099 U	0.001 U
Total PCBs	0.009 U	0.025	0.022	0.026	0.078	0.013	0.018 U

Results presented for composite samples are the mean of three replicate samples.

One-half of the sample-specific method detection limit (MDL) is used to represent non-detects in calculation of Total PCBs.

Total Polychlorinated Biphenyls (PCBs) calculated as the sum of the 18 NOAA congeners multiplied by 2.

B – Analyte found in laboratory blank.

J – Estimated value.

mg/L - Milligram per liter.

U – Not detected above the laboratory reporting limit (RL).

ug/L - Microgram per liter.

x – Congener is not one of the 18 NOAA congeners included in Total PCBs.

Due to a laboratory spiking error, all non-detected pesticide results for elutriate composite 3, 4, and 5 samples are considered unusable and the pesticide detects, PCB detects and PCB non-detects for these composites are considered as estimated with a low bias.

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Table 15 Suspended Particulate Phase Testing – Bioassay Findings

Sample ID	<i>A. bahia</i>	<i>M. beryllina</i>	<i>A. punctulata</i>	
	LC50 (%)	LC50 (%)	LC50 (%)	EC50 (%)
Unmitigated Assays				
Composite 1 Elutriate	>100%	65%	7%	4%
Composite 2 Elutriate	>100%	57%	13%	4%
Composite 3 Elutriate	74%	58%	3%	3%
Composite 4 Elutriate	>100%	69%	10%	7%
Composite 5 Elutriate	73%	56%	5%	4%
Composite 6 Elutriate	>100%	>100%	22%	22%
Mitigated Assays				
Composite 1 Elutriate	>100%	>100%	>100%	>100%
Composite 2 Elutriate	>100%	>100%	>100%	>100%
Composite 3 Elutriate	>100%	>100%	>100%	>100%
Composite 4 Elutriate	>100%	>100%	>100%	>100%
Composite 5 Elutriate	>100%	>100%	>100%	>100%
Composite 6 Elutriate	>100%	>100%	>100%	>100%

Americamysis bahia – survival endpoint

Menidia beryllina – survival endpoint

Arbacia punctulata – survival and development endpoints

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Table 16 Suspended Particulate Phase Testing – Water Quality Data Summary - Unmitigated

Sample ID	Temperature (°C)		pH (SU)		Salinity (‰)		Ammonia (mg/L) Start		Ammonia (mg/L) End	
	Start	End	Start	End	Start	End	Total	Unionized	Total	Unionized
<i>A. bahia</i>										
Lab Control	20	19	7.96	7.76	31	31	<0.1	<0.0030	1.6	0.0280
CLDS Reference	20	19	7.91	7.74	29	32	<0.1	<0.0027	1.6	0.0267
Composite 1	20	19	7.68	8.30	29	32	33	0.5251	17	0.9850
Composite 2	19	19	7.78	8.34	29	31	35	0.6489	19	1.2067
Composite 6	20	19	7.97	8.25	31	31	12	0.3627	6	0.3135
Lab Control	21.0	19	7.95	7.73	30.4	33	<0.1	<0.0034	1.6	0.0276
CLDS Reference	20.0	19	7.87	7.69	27.6	30	<0.1	<0.0024	1.7	0.0326
Composite 3	19.8	19	7.70	8.32	28.0	32	35	0.5381	25	1.5126
Composite 4	19.9	19	7.77	8.34	28.2	31	33	0.6048	25	1.3973
Composite 5	19.3	19	7.62	8.33	28.7	32	12	0.3508	9.3	1.7311
<i>M. beryllina</i>										
Lab Control	23	19	7.92	7.75	30	30	<0.1	<0.0034	1.6	0.0276
CLDS Reference Water	19	19	7.89	7.80	28	31	<0.1	<0.0024	1.7	0.0326
Composite 1	21	19	7.63	8.31	28	31	35	0.5381	25	1.4881
Composite 2	20	19	7.74	7.26	28	30	33	0.6048	25	1.3421
Composite 6	19	19	7.98	8.20	28	32	12	0.3508	9.3	0.4332
Lab Control	22.0	18	7.97	7.86	30.3	33	<0.1	<0.0035	1.4	0.0283
CLDS Reference Water	20.0	18	7.88	7.82	27.5	31	<0.1	<0.0025	1.3	0.0243
Composite 3	19.8	17	7.69	8.27	29.0	32	33	0.5453	24	1.1307
Composite 4	20.0	18	7.76	8.30	28.1	32	35	0.5174	20	1.0800
Composite 5	19.2	15	7.66	8.25	28.7	31	12	0.5314	29	1.1396
<i>A. punctulata</i>										
Lab Control	20	21	7.98	8.02	31	32	<0.1	<0.0031	0.36	0.0130
CLDS Reference Water	19	21	7.91	8.06	29	31	<0.1	<0.0025	0.3	0.0119
Composite 1	21	21	7.68	8.43	29	29	33	0.5650	31	2.7659
Composite 2	20	21	7.73	8.42	29	29	35	0.6236	29	2.5337
Composite 6	20	21	7.97	8.35	31	31	12	0.3627	11	0.8202
Lab Control	19	20.4	7.92	8.04	31	30.3	<0.1	<0.0025	0.9	0.0328
CLDS Reference Water	18.5	20.5	7.95	8.08	30	28.1	<0.1	<0.0026	0.14	0.0057
Composite 3	19.9	19.9	7.76	8.32	30	30.9	34	0.6400	20	1.2963

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Table 16 Suspended Particulate Phase Testing – Water Quality Data Summary – Unmitigated (Continued)

Sample ID	Temperature (°C)		pH (SU)		Salinity (‰)		Ammonia (mg/L) Start		Ammonia (mg/L) End	
	Start	End	Start	End	Start	End	Total	Unionized	Total	Unionized
Composite 4	20.1	20.0	7.87	8.36	30	30.0	30	0.7342	23	1.6434
Composite 5	20.1	19.9	7.70	8.35	30	29.8	36	0.6004	22	1.5296

Table 17 Suspended Particulate Phase Testing –Water Quality Data Summary - Mitigated

Sample ID	Temperature (°C)		pH (SU)		Salinity (‰)		Ammonia (mg/L) Start		Ammonia (mg/L) End	
	Start	End	Start	End	Start	End	Total	Unionized	Total	Unionized
<i>A. bahia</i>										
Lab Control	19	20	8.0	7.84	31	34	<0.1	<0.0030	1.4	0.0311
CLDS Reference Water	19	20	7.97	7.73	29	33	<0.1	<0.0028	1.7	0.0296
Composite 1	21	20	7.83	7.82	28	30	2	0.0483	2.9	0.0630
Composite 2	19	20	7.85	7.80	28	30	3.1	0.0677	3.7	0.0768
Composite 3	21	20	7.79	7.83	28	30	3.4	0.0750	3.5	0.0777
Composite 4	19	20	7.95	7.89	28	30	3.3	0.0902	3.5	0.0889
Composite 5	19	20	7.86	7.91	28	30	2.9	0.0648	3	0.0797
Composite 6	22	20	7.97	7.86	28	29	1.2	0.0426	2.6	0.0621
<i>M. beryllina</i>										
Lab Control	19	20	8.00	7.73	31	32	<0.1	<0.0030	2	0.0350
CLDS Reference Water	19	20	7.97	7.82	29	32	<0.1	<0.0028	2.2	0.0472
Composite 1	21	20	7.83	8.86	28	30	2	0.0483	2.9	0.0689
Composite 2	19	20	7.85	7.92	28	32	3.1	0.0677	3.3	0.0887
Composite 3	21	20	7.79	7.84	28	30	3.4	0.0750	3.7	0.0840
Composite 4	19	20	7.95	7.89	28	30	3.3	0.0902	3.5	0.0889
Composite 5	19	20	7.80	7.88	28	30	2.9	0.0566	3.2	0.0795
Composite 6	22	20	7.97	7.81	28	29	1.2	0.0426	2.6	0.0555
<i>A. punctulata</i>										
Lab Control	19	20	7.91	8.00	31	33	<0.1	<0.0025	0.15	0.0048
Composite 1	20	21	7.79	8.04	30	31	1.1	0.0223	1.2	0.0456
Composite 2	19	21	7.72	8.13	30	32	2.4	0.0386	2.4	0.1105
Composite 3	20	20	8.01	8.11	30	31	1.4	0.0465	1.4	0.0578
Composite 4	20	20	8.01	8.15	30	32	2.3	0.0764	2.2	0.0986
Composite 5	20	20	7.74	8.14	32	32	2.6	0.0466	2.7	0.1184
Composite 6	20	21	7.88	8.12	30	30	1.7	0.0422	1.8	0.0820

Table 18 Sediment Chemistry Results

Analyte	CAD-1 4.4-		CAD-2 5.3-		CAD-3 6.1-		DS-1 0-7.3	DS-2 0-7.0	R1	S1	TB-1 0-5.2	TB-1 5.2-6.0	TB-2	US-1 0-5.5	US-2 0.0-5.0	US-2 5.0-6.0	V1	W1
	CAD-1 0-4.0	9.0	CAD-2 0.5.3	10.8	CAD-3 0-5.5	9.9												
Total Solids (%)	42.7	50.7	43.6	50.4	45.8	55.4	37.4	37.5	40.8	41.2	37.5	73.4	36.6	36.3	42	74.9	32.1	38.9
Moisture (%)	57.3	49.3	56.4	49.6	54.2	44.6	62.6	62.5	59.2	58.8	62.5	26.6	63.4	63.7	58	25.1	67.9	61.1
Total Organic Carbon (%)	2.2	1.27	2.085	1.33	2.03	1.6	2.525	3.02	2.875	2.49	2.505	0.071	2.705	3.37	2.905	0.0165	2.92	3.065
Total Metals (mg/kg)																		
Arsenic, Total	9.64	7.2	10.3	7.38	9.33	7.29	9.97	9	9.5	7.85	8.12	1.64	9.42	10.3	9.43	1.31	10.4	8.24
Cadmium, Total	1.01	0.163 J	0.574	0.133 J	0.568	0.141 J	1.53	1.77	1.42	1.46	0.618	0.068 J	0.597	1	2.48	0.267 U	0.545 J	2.74
Chromium, Total	74.2	27.4	45.5	26.6	51.2	25.5	102	105	97.9	94.4	64.9	9.69	67.8	85.2	117	6.16	67.8	110
Copper, Total	139	10.5	75.6	8.63	103	10.5	135	134	144	132	86.7	11.9	89.7	129	178	5.2	86.2	189
Lead, Total	70.6	8.92	48.8	7.78	56.4	9.49	75.7	69.5	85	79.5	49.8	8.4	53.8	77.9	100	5.3	55.4	109
Nickel, Total	23.3	16.5	19.8	16.4	20	16.4	28.8	28	31.7	28.8	23.6	5.58	25	30.2	31.7	4.16	27.1	31.4
Zinc, Total	210	48.9	142	48.4	159	44.3	224	235	226	214	165	21.4	173	216	263	11.5 J	173	256
Mercury, Total	0.699	0.007 J	0.667	0.021 U	0.784	0.015 J	0.382	0.433	0.367	0.383	0.219	0.016	0.21	0.299	0.418	0.014 U	0.191	0.49
Organochlorine Pesticides (ug/kg)																		
4,4-DDD	0.541 U	0.463 U	0.54 U	0.456 U	2.05	0.421 U	0.909	1.5	1.21	1.3	0.704	0.654 U	0.932	1.56	1.84	0.599 U	0.77	1.83
4,4-DDE	1.52	0.463 U	0.942	0.456 U	0.926	0.421 U	3.6	4.93	4.66	4.2	2.03	0.654 U	1.93	3.77	6.16	0.599 U	1.62	5.72
4,4-DDT	0.541 U	0.463 U	0.54 U	0.456 U	0.541	0.421 U	1.36	1.73	3.4	3.44	0.691	0.654 U	2.14	3.42	4.7	0.599 U	0.768	6.96
<i>Total DDT</i>	<i>2.061</i>	<i>0.6945 U</i>	<i>1.482</i>	<i>0.684 U</i>	<i>3.517</i>	<i>0.6315 U</i>	<i>5.869</i>	<i>8.16</i>	<i>9.27</i>	<i>8.94</i>	<i>3.425</i>	<i>0.981 U</i>	<i>5.002</i>	<i>8.75</i>	<i>12.7</i>	<i>0.8985 U</i>	<i>3.158</i>	<i>14.51</i>
Aldrin	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	0.585 U	0.597 U	0.662 U	0.654 U	0.656 U	0.631 U	0.571 U	0.599 U	0.747 U	0.595 U
cis-Chlordane	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	1.04	0.754	0.662 U	0.654 U	0.656 U	1.38	1.49	0.599 U	0.825	2.16
cis-Nonachlor	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	1.52	0.934	0.662 U	0.654 U	0.656 U	0.687	1.85	0.599 U	0.747 U	1.89
Dieldrin	0.541 U	0.463 U	0.54 U	0.456 U	0.533	0.421 U	0.799	1.81	0.953	1.2	0.662 U	0.654 U	1.79	1.25	1.12	0.599 U	0.954	1.12
Endosulfan I	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	0.585 U	0.597 U	0.662 U	0.654 U	0.656 U	0.631 U	0.571 U	0.599 U	0.747 U	0.595 U
Endosulfan II	1.38	0.463 U	0.887	0.456 U	0.989	0.421 U	2.92	0.652 U	5.46	6.3	1.46	0.654 U	0.656 U	3.97	10.2	0.599 U	1.29	12.4
Endrin	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	0.585 U	0.597 U	0.662 U	0.654 U	0.656 U	0.631 U	0.571 U	0.599 U	0.747 U	0.595 U
gamma-BHC	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	0.688	0.883	0.662 U	0.654 U	0.656 U	0.998	1.23	0.599 U	0.747 U	1.54
Heptachlor	0.541 U	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.662 U	0.652 U	0.585 U	0.597 U	0.662 U	0.654 U	0.656 U	0.631 U	0.571 U	0.599 U	0.747 U	0.595 U
Heptachlor epoxide	1.08 U	0.927 U	1.08 U	0.913 U	1.05 U	0.843 U	1.32 U	1.3 U	1.17 U	1.19 U	1.32 U	1.31 U	1.31 U	1.26 U	1.14 U	1.2 U	1.49 U	1.19 U
Hexachlorobenzene	1.08 U	0.927 U	1.08 U	0.913 U	1.05 U	0.843 U	1.32 U	1.3 U	1.17 U	1.19 U	1.32 U	1.31 U	1.31 U	1.26 U	1.14 U	1.2 U	1.49 U	1.19 U
Methoxychlor	3.6	1.85 U	2.16 U	1.82 U	3.71	1.68 U	2.65 U	3.66	6.14	3.44	2.65 U	2.61 U	2.62 U	3.89	7.97	2.4 U	2.99 U	7.88
Oxychlordane	4.2	0.927 U	1.08 U	16.4	1.05 U	0.843 U	3.81	4.82	7.92	6.41	3.24	1.31 U	3.73	5.85	10.6	1.2 U	3.66	12.3
Toxaphene	27.2 U	23.3 U	27.1 U	22.9 U	26.3 U	21.2 U	33.2 U	32.7 U	29.4 U	30 U	33.2 U	32.8 U	32.9 U	31.7 U	28.6 U	30.1 U	37.5 U	29.9 U
trans-Chlordane	3.25	0.463 U	1.42	0.456 U	1.36	0.421 U	7.57	8.37	28.1	27	5.12	0.654 U	5.78	17.6	36	0.599 U	4.62	56.3
trans-Nonachlor	0.666	0.463 U	0.54 U	0.456 U	0.524 U	0.421 U	0.721	0.852	2.99	1.97	0.662 U	0.654 U	0.656 U	1.86	3.65	0.599 U	0.747 U	0.595 U

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Table 19 10-Day Whole Sediment Bioassay - Findings

A. *bahia* percent survival results

	Replicate Survival at the End of 10-Day Exposure (%)					Mean Survival (%)	Statistically Different from CLDS Reference ^a ?	Difference in Survival >20% Compared to CLDS Reference?
	A	B	C	D	E			
Lab Control	100%	100%	100%	90%	100%	98%	--	--
CLDS Reference	10%	30%	75%	100%	100%	63%	--	--
Composite 2	95%	95%	95%	90%	85%	92%	No	No ^a
Composite 3	85%	95%	90%	100%	85%	91%	No	No ^a
Composite 4	95%	90%	90%	85%	95%	91%	No	No ^a
Composite 5	90%	95%	100%	90%	100%	95%	No	No ^a
Composite 6	90%	100%	100%	100%	90%	96%	No	No ^a

^a The difference in survival is >20%, however survival is improved in the site composite samples as compared with the CLDS reference sediment.

L. *plumulosus* percent survival results

	Replicate Survival at the End of 10-Day Exposure (%)					Mean Survival (%)	Statistically Different from CLDS Reference ^a ?	Difference in Survival >20% Compared to CLDS Reference?
	A	B	C	D	E			
Lab Control	95%	100%	100%	95%	100%	98%	--	--
CLDS Reference	95%	100%	100%	15%	85%	79%	--	--
Composite 2	100%	90%	90%	90%	100%	94%	No	No
Composite 3	95%	100%	90%	95%	100%	96%	No	No
Composite 4	90%	95%	85%	95%	95%	92%	No	No
Composite 5	100%	100%	95%	100%	100%	99%	No	No ^a
Composite 6	90%	95%	100%	90%	95%	90%	No	No

^a The difference in survival is equal to 20% in Composite 5, however survival is improved in all the site composite samples as compared with the CLDS reference sediment.

Table 20 10-Day Whole Sediment Bioassay - Lab Control Performance and Assay Acceptability Criteria Summary

Endpoint / Measurement	Protocol Criteria	Unit	<i>A. bahia</i>	<i>L. plumulosus</i>
Mean Survival	Laboratory Control \geq 90%	%	98%	98%
		Protocol Met	Yes	Yes
Salinity	Minimum:	<i>A. bahia</i> - 28‰	24.6	17.2
		<i>L. plumulosus</i> - 18‰	Protocol Met	No ^a
	Maximum:	<i>A. bahia</i> - 32‰	32.9	23.6
		<i>L. plumulosus</i> - 22‰	Protocol Met	No ^a
Temperature	Mean: 20 \pm 1°C	Daily / Hourly °C	20.9 / 21.0	20.9 / 21.0
	Minimum: 17°C	Daily / Hourly °C	19.7 / 19.8	20.0 / 19.8
	Maximum: 23°C	Daily / Hourly °C	21.7 / 21.8	21.7 / 21.8
		Protocol Met	Yes / Yes	Yes/ Yes

^a Salinity values recorded on day 9 of the *A. bahia* assay and day 10 of both assays fell below their acceptable ranges; however, these results appear to have been related to an issue with a salinity probe. Mean salinity for the assays were within their target ranges and the control survival met acceptance criteria demonstrating that the test organisms are tolerant of salinities within the ranges measured.

Table 21 10-Day Whole Sediment Bioassay Water Quality Data Summary: *A. bahia*

Sample ID	Day	Temperature (° C)	pH (SU)	Salinity (‰)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<i>A. bahia</i> – Overlying Water Quality Data						
Lab Control	00	20.3	7.71	28.02	0.15	0.0026
CLDS Reference	00	20.0	7.82	28.42	<0.1	<0.0022
Composite 2	00	20.1	7.89	28.39	1.6	0.0413
Composite 3	00	20.0	7.92	28.72	1.8	0.0493
Composite 4	00	20.3	7.91	28.66	2.2	0.0602
Composite 5	00	20.6	7.90	28.57	2.5	0.0684
Composite 6	00	20.7	7.89	28.64	0.61	0.0164
Lab Control	03	21.2	7.54	28.88	0.63	0.0080
CLDS Reference	03	21.0	7.67	29.19	0.13	0.0022
Composite 2	03	21.1	7.74	29.75	3	0.0590
Composite 3	03	21.1	7.77	29.20	1.6	0.0338
Composite 4	03	21.2	7.79	29.09	1.8	0.0401
Composite 5	03	21.2	7.81	29.45	3.4	0.0790
Composite 6	03	21.3	7.82	30.09	<0.1	<0.0024
Lab Control	10	21.2	7.57	24.75	0.56	0.0078
CLDS Reference	10	20.9	7.73	25.44	0.15	0.0029
Composite 2	10	21.2	7.90	25.41	0.21	0.0061
Composite 3	10	21.2	7.99	25.31	0.16	0.0057
Composite 4	10	21.2	8.03	25.67	0.31	0.0120
Composite 5	10	21.3	8.12	24.60	0.21	0.0101
Composite 6	10	21.3	7.97	25.87	<0.1	<0.0034

Data in overlying water summary were obtained from the “A” replicate of each *A. bahia* treatment. Ammonia levels in the sediment were mitigated prior to the addition of sediments to the test vessels. See Table 5 for the ammonia mitigation measurements.

Table 22 10-Day Whole Sediment Bioassay Water Quality Data Summary: *L. plumulosus*

Sample ID	Day	Temperature (° C)	pH (SU)	Salinity (‰)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<i>L. plumulosus</i> – Overlying Water Quality Data ^a						
Lab Control	00	20.2	7.78	18.5	<0.1	<0.0021
CLDS Reference	00	20.0	7.78	19.01	<0.1	<0.0021
Composite 2	00	20.3	7.93	18.78	4.3	0.1298
Composite 3	00	20.3	7.89	18.59	2.1	0.0580
Composite 4	00	20.3	8.91	18.62	2.2	0.0636
Composite 5	00	20.3	7.90	19.12	2	0.0564
Composite 6	00	20.4	7.89	19.35	0.68	0.0189
Lab Control	03	21.1	6.30	18.63	0.47	0.0004
CLDS Reference	03	20.8	6.52	19.67	<0.1	<0.0001
Composite 2	03	21.0	7.26	21.06	5.7	0.0392
Composite 3	03	21.1	7.48	18.94	1.6	0.0185
Composite 4	03	21.1	7.54	18.93	1.7	0.0226
Composite 5	03	21.1	7.59	18.74	2.6	0.0387
Composite 6	03	21.2	7.62	19.89	0.61	0.0097
Lab Control	10	20.8	7.00	18.26	0.27	0.0010
CLDS Reference	10	20.8	7.17	18.75	<0.1	<0.0006
Composite 2	10	20.8	7.46	20.68	0.18	<0.0019
Composite 3	10	21.0	7.59	18.21	<0.1	<0.0015
Composite 4	10	21.0	7.66	18.24	<0.1	<0.0017
Composite 5	10	21.1	7.75	17.36	<0.1	<0.0022
Composite 6	10	21.1	7.72	17.18	<0.1	<0.0020
<i>L. plumulosus</i> – Pore Water Quality Data ^b						
Lab Control	-02	21.0	4.19	30	1.3	0.0000073
CLDS Reference	-02	20.1	7.68	30	2.3	0.0367
Composite 2	-01	21.0	7.60	30	25	0.3551
Composite 3	-01	21.1	7.59	30	32	0.4476
Composite 4	-01	21.1	7.69	30	32	0.5615
Composite 5	-01	21.0	7.56	30	23	0.2983
Composite 6	-01	21.1	7.70	30	11	0.1974

Table 22 10-Day Whole Sediment Bioassay Water Quality Data Summary: *L. plumulosus* (Continued)

Sample ID	Day	Temperature (° C)	pH (SU)	Salinity (‰)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<i>L. plumulosus</i> – Pore Water Quality Data ^a						
Lab Control	00	20.9	5.82	20	0.69	0.0002
CLDS Reference	00	21.0	7.75	22	<0.5	<0.0104
Composite 2	00	21.0	7.65	24	15	0.2467
Composite 3	00	21.2	7.73	20	6.5	0.1329
Composite 4	00	21.2	7.79	20	6.9	0.1614
Composite 5	00	21.2	7.60	21	16	0.2424
Composite 6	00	21.1	7.84	20	3.8	0.0987
Lab Control	03	21.2	6.10	19	1.8	0.0009
CLDS Reference	03	21.1	7.63	21	0.28	0.0045
Composite 2	03	21.0	7.57	22	7.2	0.0999
Composite 3	03	20.9	7.44	20	2	0.0207
Composite 4	03	21.0	7.58	20	3.2	0.0459
Composite 5	03	21.1	7.39	20	6.7	0.0628
Composite 6	03	21.1	7.74	21	0.91	0.0188
Lab Control	10	21.2	6.60	20	1.2	0.019
CLDS Reference	10	21.0	7.41	21	0.26	0.0025
Composite 2	10	21.2	7.24	21	0.8	0.0053
Composite 3	10	21.3	7.26	21	0.1	0.0007
Composite 4	10	21.1	7.31	21	0.36	0.0208
Composite 5	10	21.1	6.93	20	0.5	0.0016
Composite 6	10	20.9	7.51	20	0.2	0.0024

Data in water quality summary are obtained from the “Surrogate” replicate of each treatment.

Ammonia levels in the sediment were mitigated prior to the addition of sediments to the test vessels. See Table 5 for the ammonia mitigation measurements.

^a In-life assay pore water monitoring.

^b Pre-assay pore water monitoring to confirm unionized ammonia levels were below 0.8 mg/L threshold for assay initiation.

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Table 23 28-Day Bioaccumulation Bioassay - Findings

***M. nasuta* Survival**

	<u>Replicate Survival at the End of 28-Day Exposure (%)</u>					Mean Survival (%)	Statistically Different from CLDS Reference ^a ?
	A	B	C	D	E		
Lab Control	100%	95%	100%	100%	100	99%	--
CLDS Reference	100%	100%	100%	100%	95%	99%	--
Composite 2	100%	100%	100%	100%	100%	100%	No
Composite 3	100%	100%	90%	100%	100%	98%	No
Composite 4	95%	90%	95%	100%	100%	96%	No
Composite 5	90%	90%	90%	100%	100%	94%	No
Composite 6	100%	100%	90%	100%	100%	98%	No

***N. virens* Survival**

	<u>Replicate Survival at the End of 28-Day Exposure (%)</u>					Mean Survival (%)	Statistically Different from CLDS Reference ^a ?
	A	B	C	D	E		
Lab Control	95%	100%	100%	95%	90%	96%	--
CLDS Reference	100%	100%	95%	100%	95%	98%	--
Composite 2	100%	100%	95%	100%	85%	96%	No
Composite 3	100%	95%	100%	95%	95%	97%	No
Composite 4	100%	100%	95%	95%	95%	97%	No
Composite 5	95%	95%	95%	90%	90%	93%	Yes
Composite 6	100%	95%	85%	100%	90%	94%	No

^a Statistically significant difference ($\alpha=0.05$) from Reference.

Table 24 28-Day Bioaccumulation Bioassay – Lab Control Performance and Assay Acceptability Criteria Summary

Endpoint/Measurement	Protocol Criteria	Unit	<i>M. nasuta</i>	<i>N. virens</i>
Mean Survival	Laboratory control $\geq 90\%$	%	99%	96%
		Protocol Met	Yes	Yes
Tissue Mass	Sufficient for analysis	Protocol Met	Yes	Yes
Salinity	Minimum: 28‰	‰	25.7	13.3
		Protocol Met	No ^a	No ^a
	Maximum: 32‰	‰	32.0	31.1 ^c
Temperature	Mean: 12-16°C Minimum: 11°C Maximum: 17°C	Protocol Met	Yes	Yes
		Daily/Hourly	11.6 ^c / 12.0	11.4 ^b / 12.0
		Daily/Hourly	11.0 / 11.8	10.8 ^c / 11.8
		Daily/Hourly	12.4 / 12.5	12.2 / 12.5
		Protocol Met	Yes / Yes	No ^b / Yes

^a The salinity of the incoming water for the assay was below the target range on one day. The lowest recorded value of 13.3 ‰ in one replicate is likely an erroneous reading. Control survival in both assays met acceptance criteria demonstrating that the test organisms are tolerant of salinities within the ranges measured.

^b Although slightly low, the daily temperature values are still within the normal temperature range tolerated by these species.

^c This value meets the criterion when rounded to the whole number precision reflected in the protocol.

Table 25 Tissue Analysis – Mean Chemical Concentrations and Statistical Findings for *M. nasuta* Tissue

Analyte	CLDS						
	Native Tissue	Reference	Composite 2	Composite 3	Composite 4	Composite 5	Composite 6
Total Metals (mg/kg)							
Arsenic	1.8	2.3	1.9 NS	2.3 NS	1.8 NS	1.8 NS	1.7 NS
Cadmium	0.029 b	0.024 b	0.030 bS	0.027 bNS	0.025 bNS	0.026 bNS	0.028 bNS
Chromium	0.46	0.49 b	0.47 NS	0.38 bNS	0.46 NS	0.32 bNS	0.49 NS
Copper	1.6	1.9	2.1 NS	2.1 NS	2.2 NS	1.5 NS	2.2 NS
Lead	0.28	0.46	0.45 NS	0.40 NS	0.40 NS	0.31 NS	0.61 S
Mercury	0.0037 b	0.0064 b	0.0031 abNS	0.0018 abNS	0.0023 abNS	0.0020 abNS	0.0074 bNS
Nickel	0.38	0.42	0.34 NS	0.36 NS	0.33 NS	0.32 NS	0.35 NS
Zinc	9.7	9.4	9.8 NS	10.7 NS	9.1 NS	8.8 NS	9.6 NS
Polycyclic Aromatic Hydrocarbons (ug/kg)							
Acenaphthene	2.4 a	2.3 a	2.3 ac	2.7 abc	2.3 ac	2.3 ac	2.4 ac
Acenaphthylene	2.4 a	2.3 a	2.3 ac	2.2 ac	2.3 ac	2.3 ac	2.4 ac
Anthracene	2.4 a	2.3 a	3.7 abc	7.4 bc	6.6 bc	2.3 ac	4.4 abc
Benzo(a)anthracene	2.4 a	3.6 ab	18 S	24 S	23 S	7.5 bS	28 S
Benzo(a)pyrene	2.4 a	2.3 a	7.7 bc	8.9 bc	9.6 bc	2.7 abc	17 c
Benzo(b)fluoranthene	2.4 a	2.8 ab	16 S	17 S	17 S	7.8 bS	23 S
Benzo(k)fluoranthene	2.4 a	2.3 a	8.2 bc	11 bc	11 bc	4.4 abc	17 c
Benzo(g,h,i)perylene	2.4 a	2.3 a	2.3 ac	3.8 abc	4.2 abc	2.3 ac	7.6 bc
Chrysene	2.4 a	2.8 ab	17 S	23 S	24 S	7.6 bS	30 S
Dibenzo(a,h)anthracene	2.4 a	2.3 a	2.3 ac	2.2 ac	2.3 ac	2.3 ac	2.4 ac
Fluoranthene	3.5 ab	6.3 ab	55 S	98 S	83 S	29 S	78 S
Fluorene	2.4 a	2.3 a	2.3 ac	2.2 ac	2.3 ac	2.3 ac	2.4 ac
Indeno(1,2,3-c,d)pyrene	2.4 a	2.3 a	2.3 ac	2.7 abc	2.8 abc	2.3 ac	5.0 abc
Naphthalene	2.4 a	2.3 a	2.3 ac	2.2 ac	2.3 ac	2.3 ac	2.4 ac
Phenanthrene	2.4 a	4.2 ab	12.0 S	16 S	22 S	6.9 bS	11 bS
Pyrene	3.3 ab	9.1 b	45 S	72 S	64 S	23 S	113 S
Total LMW PAHs ¹	14	16	25	33	38	18	25
Total HMW PAHs ¹	26	36	174	263	241	89	321
Total PAHs ¹	40	52	199	295	279	107	346
Polychlorinated Biphenyl Congeners (ug/kg)							
PCB 8	0.24 a	0.23 a	0.40 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 18	0.47 ab	0.23 a	0.90 ac	1.8 c	1.5 c	0.62 ac	0.52 ac
PCB 28	0.24 a	0.23 a	2.2 abc	0.61 abc	0.80 bc	0.23 ac	0.24 ac
PCB 44	0.24 a	0.23 a	0.40 abc	0.35 abc	0.60 abc	0.23 ac	0.24 ac
PCB 52	0.24 a	0.23 a	1.2 c	1.4 c	1.8 c	0.23 ac	0.24 ac
PCB 66	0.24 a	0.23 a	0.63 bc	0.56 bc	0.90 bc	0.23 ac	0.24 ac
PCB 101	0.24 a	0.23 a	1.2 c	0.83 bc	1.4 c	0.38 abc	0.30 abc
PCB 105	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 118	0.24 a	0.23 a	0.61 bc	0.42 abc	0.90 bc	0.28 abc	0.29 abc
PCB 128	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 138	0.24 a	0.23 a	0.82 bc	0.72 bc	1.2 bc	0.33 abc	0.31 abc
PCB 153	0.24 a	0.23 a	0.79 bc	0.69 bc	1.0 bc	0.32 abc	0.29 abc
PCB 170	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 180	0.24 a	0.23 a	0.23 ac	0.22 ac	0.30 abc	0.23 ac	0.24 ac
PCB 187	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 195	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 206	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
PCB 209	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Total PCBs ¹	9.0	8.3	22	19	24	10	10
Pesticides (ug/kg)							
Aldrin	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
cis-Chlordane	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.30 ac	0.24 ac
trans-Chlordane	0.24 a	0.23 a	0.23 ac	2.1 c	1.5 c	1.0 ac	0.24 ac
cis-Nonachlor	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
trans-Nonachlor	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Oxychlordane	0.47 a	0.46 a	0.62 ac	0.56 ac	0.45 ac	0.46 ac	0.47 ac
Total Chlordanes	1.4	1.4	1.5	3.3	2.6	2.2	1.4
4,4'-DDT	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.29 ac	0.24 ac
4,4'-DDD	0.24 a	0.23 a	0.23 ac	0.22 ac	0.28 ac	0.23 ac	0.24 ac
4,4'-DDE	0.24 a	0.33 a	0.73 S	0.70 S	0.91 S	0.35 aNS	0.24 aNS
Total DDT ¹	0.71	0.79	1.2	1.1	1.4	0.87	0.71
Dieldrin	0.24 a	0.23 a	0.23 ac	0.22 ac	0.28 ac	0.23 ac	0.24 ac
alpha-Endosulfan	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
beta-Endosulfan	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Endosulfans ¹	0.47	0.46	0.46	0.44	0.45	0.46	0.47
Endrin	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Heptachlor	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Heptachlor epoxide	0.47 a	0.46 a	0.46 ac	0.44 ac	0.45 ac	0.46 ac	0.47 ac
Hexachlorobenzene	0.47 a	0.46 a	0.46 ac	0.44 ac	0.45 ac	0.46 ac	0.47 ac
Lindane	0.24 a	0.23 a	0.23 ac	0.22 ac	0.23 ac	0.23 ac	0.24 ac
Methoxychlor	0.95 a	0.93 a	0.92 ac	0.89 ac	0.91 ac	0.91 ac	0.94 ac
Toxaphene	12 a	12 a	12 ac	11 ac	11 ac	11 ac	12 ac

Results for CLDS Reference and Composites are presented as the mean of five replicate samples. Native tissue results are presented as the mean of three replicates.

1 - Totals calculated for informational purposes only using 1/2 MDL for non-detected values. Statistical analysis not conducted on total values and qualifiers not applied.

Statistical qualifiers -

a - Analyte not detected (below MDL) in at least one replicate; mean value was calculated using one-half the MDL for the non-detect.

b - Analyte estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c - Analyte was detected in the treatment tissue sample replicates at an equal or higher mean concentration than in the associated reference site tissue, however statistical analysis is not required as the analyte was not detected in any of the reference site replicates.

NS - Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at α=0.05.

S - Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at α=0.05.

Table 26 Tissue Analysis – Mean Chemical Concentrations and Statistical Findings for *N. virens* Tissue

Analyte	Native Tissue	CLDS Reference	Composite 2	Composite 3	Composite 4	Composite 5	Composite 6
Total Metals (mg/kg)							
Arsenic	2.1	1.5	1.3 NS	1.5 NS	1.4 NS	1.4 NS	1.5 NS
Cadmium	0.030 b	0.029 b	0.028 bNS	0.029 bNS	0.028 bNS	0.022 bNS	0.024 bNS
Chromium	0.29 b	0.073 b	0.061 bNS	0.071 bNS	0.063 bNS	0.077 bNS	0.079 bNS
Copper	1.1	1.2	0.92 NS	1.1 NS	1.1 NS	1.1 NS	1.4 S
Lead	0.26	0.17	0.17 NS	0.19 NS	0.17 NS	0.13 NS	0.15 NS
Mercury	0.0021 ab	0.0016 a	0.0016 ac	0.0048 abc	0.0047 abc	0.0072 bc	0.0090 bc
Nickel	0.30	0.12	0.10 bNS	0.11 NS	0.13 NS	0.12 bNS	0.15 NS
Zinc	7.7	10.4	10.1 NS	6.7 NS	10.7 NS	13.6 NS	14.1 NS
Polycyclic Aromatic Hydrocarbons (ug/kg)							
Acenaphthene	4.9 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Acenaphthylene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Anthracene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Benzo(a)anthracene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Benzo(a)pyrene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Benzo(b)fluoranthene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Benzo(k)fluoranthene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Benzo(g,h,i)perylene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Chrysene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Dibenzo(a,h)anthracene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Fluoranthene	3.4 ab	2.3 a	4.4 abc	6.9 abc	6.9 abc	2.4 ac	6.0 bc
Fluorene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Indeno(1,2,3-c,d)pyrene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Naphthalene	2.3 a	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Phenanthrene	3.4 ab	2.3 a	2.3 ac	2.3 ac	2.2 ac	2.4 ac	2.3 ac
Pyrene	3.2 ab	2.3 a	2.9 abc	4.7 abc	5.1 abc	2.4 ac	8.3 bc
Total LMW PAHs ¹	18	14	14	14	13	14	14
Total HMW PAHs ¹	25	23	26	30	30	24	33
Total PAHs ¹	43	37	40	44	43	38	47
Polychlorinated Biphenyl Congeners (ug/kg)							
PCB 8	0.72 a	0.23 a	0.23 ac	0.23 ac	0.52 ac	0.24 ac	0.23 ac
PCB 18	1.9 a	0.23 a	0.39 ac	0.23 ac	1.1 ac	0.24 ac	0.88 ac
PCB 28	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 44	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 52	0.35 ab	0.23 a	0.63 bc	0.31 abc	0.98 bc	0.24 ac	0.23 ac
PCB 66	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 101	0.42 ab [CLDS,6]	0.23 a	0.36 abc	0.46 abc	0.78 abc	0.32 abc	0.23 ac
PCB 105	0.23 a [4]	0.23 a	0.28 abc	0.31 abc	0.22 ac	0.24 ac	0.23 ac
PCB 118	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 128	0.23 a [4]	0.23 a	0.28 abc	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 138	2.3 [CLDS,6]	1.1 b	1.9 S	1.8 NS	2.6 S	1.5 bNS	1.1 bNS
PCB 153	3.1 [CLDS,6]	1.7	3.1 NS	3.0 NS	3.8 S	2.5 NS	1.9 NS
PCB 170	1.2 b [CLDS,6]	0.40 ab	1.1 abNS	0.94 abNS	1.1 aNS	0.91 abS	0.23 aNS
PCB 180	3.0 [CLDS,6]	1.4 b	3.1 S	2.8 NS	3.3 NS	2.2 bNS	1.2 bNS
PCB 187	2.3 [CLDS,6]	1.0 b	1.9 bNS	1.9 NS	2.4 S	1.4 abNS	0.85 abNS
PCB 195	0.23 a [4]	0.23 a	0.23 ac	0.33 abc	0.22 ac	0.24 ac	0.23 ac
PCB 206	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
PCB 209	0.23 a [4]	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
Total PCBs ¹	35	17	30	28	37	23	18
Pesticides (ug/kg)							
Aldrin	0.23 a	0.23 a	0.23 ac	0.23 ac	0.28 ac	0.24 ac	0.23 ac
cis-Chlordane	0.23 a	0.23 a	0.23 ac	0.23 ac	0.49 ac	0.24 ac	0.23 ac
trans-Chlordane	0.23 a	0.23 a	0.23 ac	0.29 ac	0.40 ac	0.24 ac	0.23 ac
cis-Nonachlor	0.23 a	0.23 a	0.23 ac	0.23 ac	0.48 ac	0.24 ac	0.23 ac
trans-Nonachlor	0.23 a	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
Oxychlordane	0.47 a	0.46 a	0.46 ac	0.47 ac	0.45 ac	0.48 ac	0.47 ac
Total Chlordanes	1.4	1.4	1.4	1.5	2.0	1.4	1.4
4,4'-DDT	0.23 a	0.23 a	0.43 ac	0.23 ac	0.63 ac	0.24 ac	0.23 ac
4,4'-DDD	0.23 a	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
4,4'-DDE	0.23 a	0.23 a	0.23 ac	0.28 ac	0.22 ac	0.24 ac	0.23 ac
Total DDT ¹	0.70	0.69	0.89	0.75	1.1	0.71	0.70
Dieldrin	0.23 a	0.23 a	0.23 ac	0.23 ac	0.66 ac	0.24 ac	0.23 ac
alpha-Endosulfan	0.23 a	0.23 a	0.23 ac	0.23 ac	0.50 ac	0.24 ac	0.23 ac
beta-Endosulfan	0.23 a	0.23 a	0.23 ac	0.23 ac	0.45 ac	0.24 ac	0.23 ac
Endosulfans ¹	0.47	0.46	0.46	0.47	0.94	0.48	0.47
Endrin	0.23 a	0.23 a	0.23 ac	0.23 ac	0.22 ac	0.24 ac	0.23 ac
Heptachlor	0.23 a	0.23 a	0.23 ac	0.23 ac	0.31 ac	0.24 ac	0.23 ac
Heptachlor epoxide	0.47 a	0.46 a	0.46 ac	0.47 ac	0.45 ac	0.48 ac	0.47 ac
Hexachlorobenzene	0.47 a	0.46 a	0.46 ac	0.47 ac	1.30 ac	0.48 ac	0.47 ac
Lindane	0.23 a	0.23 a	0.23 ac	0.23 ac	0.67 ac	0.24 ac	0.23 ac
Methoxychlor	0.94 a	0.92 a	0.91 ac	0.94 ac	0.90 ac	0.95 ac	0.93 ac
Toxaphene	12 a	12 a	11 ac	12 ac	11 ac	12 ac	12 ac

Results for CLDS Reference and Composites are presented as the mean of five replicate samples. Native tissue results are presented as the mean of three replicates.

1 - Totals calculated for informational purposes only using 1/2 MDL for non-detected values. Statistical analysis not conducted on total values and qualifiers not applied.

Statistical qualifiers -

a - Analyte not detected (below MDL) in at least one replicate; mean value was calculated using one-half the MDL for the non-detect.

b - Analyte estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c - Analyte was detected in the treatment tissue sample replicates at an equal or higher mean concentration than in the associated reference site tissue, however statistical analysis is not required as the analyte was not detected in any of the reference site replicates.

NS - Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$.

S - Significant - mean tissue body burden was statistically different from the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$.

Supplemental statistics for PCBs -

Red text - Mean tissue body burden was statistically different, greater than the mean native tissue body burden. Statistical significance accepted at $\alpha=0.05$.

Purple text - Mean native tissue body burden was significantly different, greater than the mean reference or composite tissue body burden [information in brackets identifies the associated tissue that the native tissue is statistically greater than]. Statistical significance accepted at $\alpha=0.05$.

4. Chemical Analyses QA/QC

This section provides quality control information and documents the overall quality of the analytical data upon which the project conclusions are drawn. Project QA/QC information (e.g., laboratory control survival, reference toxicant results) for the biological testing program is discussed in Sections 2 and 3.

The chemical data collected during the investigation were of sufficient quality and sensitivity to meet the project objectives. The majority of the QC results associated with the analytical parameters met the measurement objectives presented in the Work Plan (AECOM, 2018a). Specific nonconformances with those measurement objectives are presented in the laboratory report narrative, RIM Checklist and AECOM-internal validation memorandum associated with each laboratory report. A full set of QC sample findings (method blanks, duplicate precision results, laboratory control sample results, and matrix spike results) is provided in Appendix C.1, Appendix C.2, and Appendix C.3.

4.1 Deviations

Due to an initial laboratory spiking error, 18 elutriate samples required re-extraction for pesticides and PCBs for elutriate composite and blank samples 3, 4, and 5. The re-extraction was performed three weeks beyond the technical hold-time of seven days. For samples with detectable pesticide hits, there was poor reproducibility between sample replicates. The non-detected pesticide results for these 18 samples are considered unusable for project objectives. The detected results should be considered estimated with a low bias.

As noted above, the PCB congeners reported for all elutriate composite samples 3, 4, and 5 were extracted beyond the project-specific work plan hold-time; however, the current EPA guidance, Table 4-1, EPA SW846 Ch. 4 Rev 5 2012, states "None" as the hold-time for PCBs. Both detects and non-detects should be considered usable as estimated with a low bias.

Elutriate and ambient seawater samples were analyzed for arsenic and selenium by method 1632A, not method 6020B as stated in the project-specific work plan.

No other deviations relative to chemical analysis were noted. These deviations are not expected to have an impact on the usability of the data for decision making.

4.2 Analytical Sensitivity

The sensitivity of program chemical measurements can sometimes dictate the ultimate usefulness of the final data. Results that are insufficiently sensitive to detect changes can limit the final project conclusions. The New Haven Harbor project required RLs were specified in the approved Work Plan (AECOM, 2018a) to detect sedimentary contaminant considerations, ambient seawater and elutriate concentrations, and bioaccumulative tissue concerns.

The Work Plan (AECOM, 2018a) summarized the laboratory RLs and project required RLs. Nondetect chemistry results were reported at laboratory RLs since they provide greater confidence. The majority of the RLs met the QAPP specifications. Laboratory reporting limits for copper, nickel, silver, zinc, and hexavalent chromium in the elutriate samples were higher than the project required limits shown in the QAPP.

Several sediment samples had elevated RLs for PAHs due to dilutions that were required by the sample matrix. The PAH RLs for two sediment samples, TB-1 5.2-6.0 and US-2 5.0-6.0, were slightly higher than the project RLs; however, the MDLs met the project RLs. Analytes detected between the RL and the MDL were reported as estimated and qualified with a J qualifier. Several sediment samples had laboratory RLs for PCB congeners slightly higher than the project RLs due to low percent solids. In all instances there were measurable concentrations of total PCBs. Laboratory RLs for the following pesticides in several sediment samples were slightly higher than the project RLs; Heptachlor epoxide, Hexachlorobenzene, Methoxychlor, Oxychlorane, and Toxaphene.

Laboratory RLs for all PCB congeners for all tissue samples exceeded the RIM required RL (0.5 ppb); however, the MDLs met the RIM RLs, which assure the sensitivity of detected results. Analyte concentrations that were detected

between the MDL and the RL were qualified as estimated and J qualified. The laboratory RL for the pesticide Methoxychlor was slightly higher than the project RL in all tissue samples.

Sample contamination can sometimes affect sample results, particularly when measuring chemical parameters at very low concentrations. In this study, potential contamination has been monitored using equipment blank QC samples. Silver and cis-Chlordane were detected in the equipment blank associated with the water pump; trans-Chlordane, cis-Chlordane, Dieldrin, and 4,4'-DDT were detected in CLDS water equipment blank, and trans-Chlordane, chromium, copper, nickel, and selenium were detected in CLDS grab equipment blank. All were at very low levels and are not considered to have an impact on sample results. Equipment blank performance data is presented in Appendix C.1.

4.3 Data Precision

Analytical precision was measured at the laboratory level using laboratory control sample (LCS) duplicates or matrix spike duplicates.

4.3.1 Elutriate and Ambient Seawater Measurement Precision

Elutriate analysis precision was evaluated using matrix duplicates, matrix spike duplicates, and Laboratory Control Sample (LCS) duplicates. Relative Percent Difference (RPD) objectives for this project were equivalent to the sediment objectives (20 percent for metals, 30 percent for trace organic compounds). The RPD criteria were met for all elutriate/seawater parameters, with the following exceptions: the RPD criteria were not met for the LCS/LCSD for Pentachlorophenol, where the reported RPD value was 40%; the sample duplicate (NHH-CLDS) for nickel where the reported RPD value was 49%; and the sample duplicate (Composite 2 -Rep1) for chromium, lead, and zinc where the reported RPD values were 62%, 26%, and 26%, respectively. These variances are not considered to adversely affect the elutriate dataset.

4.3.2 Sediment Measurement Precision

Sediment analysis precision was evaluated using matrix duplicates, matrix spike duplicates, and Laboratory Control Sample (LCS) duplicates. Relative Percent Difference (RPD) objectives for this project were 20 percent for metals and 30 percent for trace organic compounds. The RPD criteria were not met for select congeners in the laboratory duplicates; reported RPDs range from 42-51%. These may be the result of sample non-homogeneity. These variances are not considered to adversely affect the sediment dataset.

4.3.3 Tissue Measurement Precision

Tissue analysis precision was evaluated using matrix duplicates, MSDs, and LCS duplicates. The tissue RPD objectives for this project component were also 20 percent for metals and 30 percent for trace organic compounds. The RPD criteria were not met for select congeners and Zinc in the laboratory duplicates; reported RPDs range from 26-107%. These may be the result of sample non-homogeneity. The RPD criterion was not met in the MS/MSD for PCB congener C13-BZ#18; reported RPD value 55%. The RPD criteria were not met for select pesticides in the LCS/LCSD; reported RPDs range from 31-122%. These variances are not considered to adversely affect the tissue dataset.

4.4 Data Accuracy

Accuracy was evaluated using several QC sample types by calculating the percent recovered for each parameter of interest. A recovery value of 100% corresponds to 100% accuracy in this analysis. LCS and matrix spiked samples were incorporated as accuracy QC samples. Additionally, surrogate spikes were used to evaluate the accuracy of organic measurements and standard reference materials (SRMs) were included where available.

4.4.1 Elutriate and Ambient Seawater Analysis Accuracy

The chromium and silver results in the LCSs associated with NHH-CLDS and all elutriate composite samples were reported between 0% and 6%, this would represent a low bias for detected results in the associated samples; the non-detect results would be unusable. The cadmium, copper, lead, nickel, and zinc results in the LCSs associated with NHH-CLDS and all of the elutriate composite samples 1, 2, and 6 and the copper result in the LCS associated with all of the elutriate composite samples 3, 4, and 5, were below the lower control limit of 80%. This would represent a low bias in the associated samples for these analytes. Heptachlor was reported at 39% and 37% and Aldrin was reported at 37% and 34% in the LCS/LCSD associated with all of the elutriate composite samples 3, 4, and 5. This would represent a low bias in the associated samples for these analytes.

Matrix spike results for cadmium, chromium, copper, lead, nickel, silver, and zinc and the MS/MSD results for Heptachlor and Aldrin associated with NHH-CLDS were below the low control limits. This would represent a low bias for the results in the associated sample. Matrix spike results for cadmium, chromium, copper, lead, nickel, silver, and zinc associated Composite 3-Rep 1 were below 30%. This would represent a low bias for the detected cadmium, chromium, and zinc results in the associated sample; the non-detected copper, lead, nickel, and silver results would be unusable. The MS/MSD results for mercury associated Composite 3-Rep 1 were 78% and 78%. This would represent a low bias for the results in the associated sample.

The recoveries for PCB congener surrogate, BZ-198, and pesticides surrogates DBOB and BZ-198 for Pump Blank and Core Blank were below the low control limits; results for these samples would be considered bias low. The recoveries for the pesticide surrogates, BZ-198, for CLDS-Water-EB and CLDS-Grab-EB and DBOB for CLDS-Grab-EB were below the low control limits; results for these samples would be considered bias low. The recovery of pesticide surrogate, BZ-198 for Composite 5-Rep 2 was above the upper control limit at 184%. All results were non-detected; no impact to the data. The recoveries of the pesticide surrogate BZ-198 on column B were above the upper control limit for Composite 4-Rep1 (291%), Composite 4-Rep 2 (360%), Composite 3-Rep 1 (271%), and Composite 3-Rep 2 (303%). Detected results on column B in these samples would be considered bias high.

4.4.2 Sediment analysis accuracy

Percent recovery objectives for sediment measurements were met with few exceptions. Results for individual target analytes exceeded control limits in some matrix spikes; this is generally indicative of a sample specific matrix interference. Also, Trans Nonachlor measured in the sediment SRM was outside of the certified range. None of the exceedances are considered to negatively impact data usability.

4.4.3 Tissue Analysis Accuracy

The SRMs represent an excellent measure of overall analytical accuracy. Results below criteria were reported for As, Cd, Zn, and PCB congener C13-BZ#28 in the SRMs; associated sample results for these analytes would be considered biased low.

An elevated recovery (122%) was reported for Hg in a metals LCS. Mercury was not detected in any of the associated samples. LCS recoveries were below criteria for pesticides Methoxychlor (17%) and Endosulfan II (45%); however, the LCSD recoveries for these analytes were within criteria.

Matrix spike recovery measurements were largely within work plan specified limits. An elevated recovery (193%) was reported for C13-BZ#18 in PCB congener MSD associated with sample B567PRENVA and a low recovery (49%) for C14-BZ#49 in PCB congener MS associated with sample B567PRENVA. More information can be found in the individual laboratory reports. None of the variances are considered to negatively impact data usability.

4.5 Chemical QA/QC Summary

All non-detected pesticide results for all elutriate composite 3, 4, and 5 samples are considered unusable and the pesticide detects, PCB detects and PCB non-detects for these composites are considered as estimated with a low

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bias. As noted in Section 3.1.2.1 and Table 15, the LC50 performance of the ammonia-mitigated SPP assays was >100% for all assays.

The hexavalent chromium data for NHH-CLDS, CLDS-Water-EB, and CLDS-Grab-EB Water may be used for information purposes but are considered rejected due to the holding time exceedance documented by the laboratory. Several non-detected elutriate metals are considered unusable due to LCS and MS non-conformances.

Remaining analytical results are considered usable as reported.

5. References

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Appendix A: Work Plan

USACE CONTRACT NO. W912WJ-17-D-0003
Delivery Order No.: W912WJ18F0109

Supplemental Sampling and Testing in
Support of the New Haven Harbor Navigation
Improvement Project:
Project Work Plan

New Haven Harbor Navigation
Improvement Project
New Haven, Connecticut

Prepared for



U.S. Army Corps of Engineers
New England District
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Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project:

Project Work Plan

New Haven Harbor Navigation Improvement Project, New Haven, Connecticut

COMMITMENT TO IMPLEMENT THE ABOVE PROJECT WORK PLAN



Kris van Naerssen,
AECOM Task Order Manager

10/18/2018

Date



Kirk Cram
EnviroSystems, Inc (ESI) Laboratory Director

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Attachments

- Attachment 1 Accident Prevention Plan (provided under separate cover)
- Attachment 2 Grab Sampling Log
- Attachment 3 Daily Activity Logs
- Attachment 4 COC Form
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- Attachment 6 EnviroSystems, Inc. Sample Receipt Condition Verification Form
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Appendices

- Appendix A Field Standard Operating Procedures
 - ES-G-01 Field Records
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 - ES-W-01 Water Quality Data and Water Collection

- Appendix B RIM QC Summary Tables

Acronyms

%R	Percent recovery
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
AWQC	Ambient Water Quality Criteria
BrCl	Bromium Monochloride
C	Celsius
CFR	Code of Federal Regulations
CLDS	Central Long Island Sound Disposal Site
COC	Chain of Custody
CR	CR Environmental
d	day
DGPS	Differential Global Positioning System
DIW	Deionized Water
DM	Dredged Material
DPM	Deputy Program Manager
DQI	Data quality indicator
DQO	Data quality objective
EDD	Electronic Data Deliverable
EM	Engineer Manual
EPA	Environmental Protection Agency
ERS	Environmental Resources Section
ESI	EnviroSystems, Inc.
FNP	Federal Navigation Project
FSP	Field Sampling Plan
GC/MS	Gas chromatography/mass spectrometry
HDPE	High density polyethylene
ICP/MS	Inductively Coupled Plasma Mass Spectrometry
ID	Identification
L	Liter
LCS	Laboratory control sample
LPC	Limited Permissible Concentration
MDL	Method detection limit
mg/L	milligrams per liter
MLLW	Mean Lower Low Water

MPRSA	Marine Protection, Research, and Sanctuaries Act
MQO	Measurement quality objectives
MS/MSD	Matrix spike/Matrix spike duplicate
NAE	New England District
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PM	Program Manager
PDS	Portland Disposal Site
PPE	Personal Protective Equipment
PWS	Performance Work Statement
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QC	Quality Control
pdf	Printed document format
RIM	Regional Implementation Manual
RL	Reporting Limit
RPD	Relative percent difference
SOP	Standard Operating Procedure
SPP	Suspended Particulate Phase
SRM	Standard Reference Material
SSHO	Site Safety and Health Officer
TM	Technical Manager
USACE	U.S. Army Corps of Engineers
µg/L	micrograms per liter

This Project Work Plan has been prepared by AECOM for the United States Army Corps of Engineers (USACE), New England District (NAE) in support of NAE's New Haven Harbor proposed navigation improvement project (proposed project) located in New Haven, Connecticut. USACE's (2001) Engineer Manual (EM) 200-1-3 *Requirements for the Preparation of Sampling and Analysis Plans* was referenced during the preparation of this Work Plan. The Work Plan has been prepared in accordance with the program design provided in the Performance Work Statement (PWS) entitled "*Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project New Haven, Connecticut*" dated 25 July 2018. The PWS scope was subsequently issued to AECOM on 21 August 2018 and was further revised by NAE on 11 October, 2018. The enclosed Work Plan is comprised of a Field Sampling Plan (FSP; Work Plan Section A) and a Quality Assurance Project Plan (QAPP; Work Plan Section B).

The New Haven Harbor dredged material suitability determination field program will be completed by both NAE personnel (harbor site sampling) and individuals on the AECOM/Ocean Surveys, Inc. (OSI) Team (collectively the AECOM Field Team). Field activities to be undertaken by the AECOM Field Team include: collection and transport of sediment and water samples from the Central Long Island Sound Disposal Site (CLDS) Reference Site; as well as receipt and delivery of NAE-collected representative sediment and water samples from the proposed navigation improvement project.

Field tasks described within this Work Plan focus primarily on activities that will be undertaken by the AECOM Field Team. Sampling techniques and Standard Operating Procedures (SOPs) to be employed by NAE personnel, relative to sediment and water collection activities within the proposed New Haven Harbor navigation project are addressed in detail under separate cover.

Field Sampling Plan

Supplemental Sampling and Testing – New Haven Harbor Navigation Improvement Project, New Haven, Connecticut

A.0 Field Sampling Plan (FSP)

A.1 Project Background

The New England District (NAE) of the US Army Corps of Engineers (USACE) is currently preparing a feasibility study for improvements to the New Haven Harbor Federal navigation project (FNP). Anticipated project components include: deepening and widening the main ship channel, widening the channel bend at Southwest Ledge, straightening the channel bend downstream of the existing turning basin; and relocating and deepening the turning basin. These combined actions would require the mechanical removal of up to 4,500,000 cubic yards of sediment and up to 32,000 cubic yards of rock depending on the selected channel alignment and dimensions. Dredged sediments are expected to be a mix of poorly graded sand and fine grained material within the existing channel profile and adjacent harbor seafloor with glaciofluvial deposits at depth. To the extent practical, suitable dredged material will be beneficially reused for marsh creation, habitat restoration, and/or as cover of historic dredged material disposal mounds at the Central Long Island Sound Disposal Site (CLDS). Unsuitable material will be placed in a confined aquatic disposal (CAD) cell to be located in the inner harbor.

NAE completed a sampling and testing effort during the summer of 2017 in order to characterize the materials to be dredged. NAE later revised the alignment of the proposed channel and turning basin based on the results of ship simulation modeling. In addition, a portion of the material from the inner harbor was determined to be unsuitable for unconfined open water placement, based on the results of suspended particulate phase and whole sediment bioassays. In July 2018, NAE coordinated a supplemental sampling and analysis plan (SAP) to characterize sediment from reaches of the redesigned project that were not previously sampled, to characterize the material that would be dredged during CAD cell construction, and to further define the extent of unsuitable material in the inner harbor. The enclosed FSP was prepared in support of this New Haven Harbor SAP.

A.2 Project Organization and Responsibilities

Highly qualified individuals have been selected for each of the tasks to ensure that the project objectives are accomplished accurately and efficiently. The project organization and work breakdown is depicted in **Figure A-1**. Individual responsibilities are detailed below.

Figure A-1 Task Order Organization and Project Contact Information



M18_006

Contact	Phone	Responsibility
R. Ben Loyd	978-318-8048	NAE Technical Manager
Don Dwight	978-905-2970	AECOM Program Manager
Maura Surprenant	508-833-6960	AECOM Deputy Program Manager
Kris van Naerssen	484-678-1876	AECOM Task Order Manager
Paula Winchell	774-454-7653	AECOM Field Services Task Leader/SSHO/Chief Scientist
C.J. Nixon	203-654-1174	AECOM Transport Driver
Rich Renzi	978-905-3137	AECOM Health & Safety Officer
Debra Simmons	978-905-2399	AECOM QA Officer
Edith Hutchinson	508-524-5442	AECOM Chemistry Coordinator
Christine Archer	603-622-1556	AECOM Biology/Bioassay Laboratory Coordinator

Contact	Phone	Responsibility
Kenneth Cadmus	860-395-8112	OSI Project Manager & Vessel Captain
Morgan Barrett	860-227-1355	OSI Vessel Captain / Mate (Alternate)
Kyle Toothaker	860-227-7995	OSI Mate
Ken Simon	603-475-7654	ESI Technical Advisor
Kirk Cram	603-926-3345	ESI Laboratory Director
Liz Porta	508-822-9300	Alpha Laboratory Project Manager

NAE Technical Manager (TM)

The NAE Technical Manager, Mr. R. Ben Loyd, will be consulted during the project planning and performance phases. As the primary point of contact for NAE and this scope of work, Mr. Loyd will be in daily contact with the AECOM project team during field sampling activities and weekly contact with the AECOM team during sample preparation, chemical and biological analysis, and in regular contact, in the event that any problems are encountered.

AECOM Program Manager (PM)

Mr. Don Dwight, serving as AECOM's Program Manager (PM), will provide overall leadership in the performance of this task order with regular NAE and AECOM team communications. Mr. Dwight will verify that the right people are committed to contract tasks, that safety and quality systems are in place, regular reviews are undertaken, issues resolved without delay and contractual specifications met or exceeded.

AECOM Deputy Program Manager (DPM)

Ms. Maura Surprenant, serving as AECOM's Deputy Program Manager (DPM), will provide daily leadership in the performance of this task order with regular NAE and AECOM team communications. Ms. Surprenant will assist Mr. Dwight with daily duties including ensuring that the right people are committed to contract tasks, that safety and quality systems are in place, regular reviews are undertaken, issues resolved without delay and contractual specifications met or exceeded.

AECOM Task Order Manager

Mr. Kris van Naerssen will serve as the AECOM Task Order Manager, with the responsibility for technical, financial, and scheduling matters related to this task. Mr. van Naerssen, as the point of contact between task leads, safety and quality managers, and program management, will communicate regularly with the project team to discuss action items, schedule, financial, and technical considerations on a regular basis during the implementation of this Work Plan and will procure the subcontractor team.

Mr. van Naerssen will also oversee the preparation of the task reports to ensure they meet or exceed NAE specifications, particularly as required by NAE's Regional Implementation Manual (RIM; Environmental Protection Agency [EPA]/USACE, 2004). Raw and statistical data will be provided to fully support agency dredged material (DM) suitability decision-making. All reports will be available electronically and the water chemistry and toxicity data will be provided in electronic data deliverable (EDD) format meeting RIM requirements. Quality control (QC) summary tables will be included with each data submission.

AECOM Safety and Health Manager (SHM)

Mr. Richard Renzi, CIH is AECOM's SHM dedicated to this investigation with direct communication to the AECOM Task Order Manager and Site Safety and Health Officer (SSHO). He will prepare/ review all modifications to the project Accident Prevention Plan (APP), and any applicable Activity Hazard Analyses (AHA). Specific duties include:

- On behalf of AECOM, reviewing and approving the APP and amendments and ensuring that Engineer Manual EM 385-1-1 requirements are fully met before delivery of the APP to the NAE TM and NAE SHE Manager for approval;
- Advising the AECOM Task Order Manager on matters relating to health and safety at the site;
- Conducting accident investigations;
- Maintaining regular contact with the project team to evaluate site conditions and new information that might require modifications to the APP; and
- Overseeing the SSHO.

Project Quality Assurance (QA) Officer

Ms. Debra Simmons will serve as the Project Quality Assurance (QA) Officer and has overall responsibility for quality assurance oversight. Ms. Simmons has led quality assurance programs for more than 30 years and in this role will communicate directly to the AECOM Task Order Manager. Specific responsibilities include:

- Implementation of this Work Plan upon approval;
- Reviewing and approving QA procedures on behalf of AECOM, including any modifications to existing approved procedures;
- Ensuring that QA audits of the various phases of the project are conducted as required; and
- Providing QA technical assistance to project staff.

Field Services Task Leader, Chief Scientist & SSHO

Ms. Paula Winchell, serving as the Field Services Task Leader will provide leadership in every aspect of the field program, and implement the sediment and water collection program. Ms. Winchell will oversee the field services subcontractor (OSI) and all AECOM Field Team sample collection activities.

The Field Services Task Leader has overall responsibility for completion of all field activities in accordance with the Work Plan and is the communication link between the Program Manager and the field team. This individual also acts as the SSHO and will engage the field personnel in daily safety discussions, field safety related documentation (float plans, etc.) and will be the primary point of contact for all field related safety communications. Specific responsibilities of the Field Services Task Leader include:

- Coordinating activities in the field, and assigning specific duties to field team members;
- Collecting samples, conducting field measurements, and decontaminating equipment according to documented procedures stated in the FSP and QAPP;
- Mobilizing and demobilizing of the field team and subcontractors;
- Directing the activities of subcontractors in the field;
- Resolving any logistical problems that could potentially hinder field activities, such as equipment malfunctions or availability, personnel conflicts, or weather dependent working conditions;
- Implementing field QC including issuance and tracking of measurement and test equipment; the proper labeling, handling, storage, shipping, and chain of custody (COC) procedures used at the time of sampling; and control and collection of all field documentation;
- Ensuring that field documentation and data are complete and accurate
- Communicating any nonconformance or potential data quality issues to the DPM.
- Serving as SSHO (see Section A.3.2); and
- Preparing the Field Report.

Chemistry Coordinator

Ms. Edith Hutchinson, as the Chemistry Coordinator, will oversee the subcontractor chemical testing. Ms. Hutchinson, a Senior Chemist, will serve as the liaison between field and laboratory personnel; supervise data review activities, and author related progress reports.

Biology/Bioassay Laboratory Coordinator

Ms. Christine Archer, an Ecotoxicologist and former bioassay laboratory biologist, will serve as the Biology/Bioassay Laboratory Coordinator. Ms. Archer will coordinate with the laboratory to implement sample composite formation, preparation of elutriate samples, and performance and reporting of the SPP, 10-day bioassay results, 28-day bioaccumulation results, and all relevant statistics.

OSI Project Manager

Ocean Surveys, Inc. (OSI) of Old Saybrook, CT will provide field services and equipment for the project. OSI will be responsible for providing and maintaining the sampling vessel for the reference site sampling, vessel and equipment handling staff, appropriate field equipment for positioning the vessel and obtaining sediment and water samples at the specified sample depths provided in the PWS. Mr. Kenneth Cadmus will serve as the OSI Project Manager and will be responsible for ensuring the Work Plan boat based field sampling and program safety requirements for OSI personnel are appropriately implemented.

Mr. Ken Cadmus, or the designated alternate, will captain the sampling vessel and oversee navigational and shipboard operations. Mr. Cadmus will implement the field survey requirements specified in this Work Plan when approved.

ESI Technical Advisor

Mr. Ken Simon, EnviroSystems Inc.'s (ESI) Technical Advisor will provide overall leadership on toxicity testing aspects of this Work Plan.

ESI Laboratory Director

Mr. Kirk Cram, ESI's Laboratory Director, will oversee ESI's implementation of this Work Plan and the specifications detailed in Section B (QAPP). ESI's responsibilities include elutriate/ SPP sample preparation, toxicological testing (both 10-day testing and the 28-day bioaccumulation testing) and associated reporting. Mr. Cram will communicate with the AECOM Biological and Chemistry Laboratory Coordinators to confirm the condition of samples arriving at the laboratory, verify the COC specified sample list and testing requirements, oversee the preparation of sample composites, standard chemical elutriate and SPP preparations, and all project bioassays. He will bring any project concerns to the AECOM Biological Laboratory Coordinator without delay, and transmit EDDs and related laboratory reports, and bioassay results with corresponding statistics and reports to the AECOM Biological Laboratory and Chemistry Coordinators according to the established project schedule.

Alpha Laboratory Manager

Ms. Liz Porta, Alpha Analytical Laboratory Project Manager will oversee the implementation of the bulk sediment chemistry, elutriate chemistry and tissue analytical portions of this Work Plan, including the specifications detailed in Section B (QAPP). Alpha will be responsible for chemical laboratory activities involving the above analyses, including data analysis and reporting. She will communicate with the AECOM Laboratory and Chemistry Coordinators to confirm the condition of samples arriving at the laboratory, verify the COC specified sample list and testing requirements, oversee the preparation of sample composites, and all project analyses. Ms. Porta will bring any project concerns to the AECOM Laboratory Coordinator without delay, and transmit the chemistry EDDs and related laboratory reports to the AECOM Laboratory and Chemistry Coordinators according to the established project schedule.

A.3 Project Scope and Objectives

The objective of this work is to acquire data for the characterization of sediments proposed for navigation improvement dredging from New Haven Harbor.

A.3.1 Task Description

This New Haven Harbor dredged material suitability determination project will require the collection of discrete sediment samples from thirteen stations throughout the FNP which are representative of the material to be dredged. Samples (cores) collected by NAE from discrete locations within the proposed project footprint will be combined into six composite samples. Seawater will also be needed to evaluate potential water column impacts (i.e., the formation of chemical elutriate and suspended particulate phase (SPP) samples). In accordance with Table A-1, materials from Composite Sample 1 will be excluded from the 10-Day and 28-Day bioassays.

The proposed work involves NAE collecting sediment cores to the project design depths, plus appropriate overdepths (see **Table A-1**) from thirteen locations along a stretch within the FNP to be analyzed for parameters as defined in Tasks 5 through 10. It is anticipated that the New Haven Harbor sediment cores will be combined into six composites for analysis. The AECOM Team will collect reference site sediments from the CLDS reference site, located at latitude 41.134850 N and longitude 72.834690 W (NAD83).

New Haven Harbor water samples will be collected by NAE from a central area to each sediment core composite location. This water will be used in the preparation of dredge site elutriate samples. The AECOM Field Team will collect water samples from the CLDS reference site location, for use in preparation of SPP samples for biological analyses and for associated water chemistry analyses.

Testing results will be used to characterize the sediment in order to determine the suitable alternatives available for disposal.

General guidance for this work is found in the EPA/USACE regional protocol “Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters” (RIM, EPA/USACE, 2004). Sampling, testing, and QA/QC procedures as required and detailed in the RIM are referenced in each task of the PWS (NAE, 2018).

To accomplish the full range of project requirements, NAE has established the following tasks:

Task	Description
1	Work Plan
2	Accident Prevention Plan
3	Field Support for Dredge Site Sediment and Water Collection
4	Reference Site Sampling
5	Sediment Chemistry
6	Standard Elutriate Testing
7	Suspended Phase Acute Toxicity Testing
7.1	Suspended Phase Acute Toxicity Testing With Ammonia Reduction (Optional)
8	10-day Whole Sediment Acute Toxicity Testing
9	28-day Bioaccumulation Testing
10	Tissue Analysis
11	Reporting

A.3.2 Health and Safety

A program specific APP has been developed and was submitted to NAE, in draft form on October 12, 2018. The APP was prepared in accordance with EM-385-1-1. The APP addresses unusual or unique aspects of the proposed scope of work to be executed (e.g., working on water, etc.). A draft version of the APP was submitted electronically to the Safety and Occupational Health Office and to the NAE Technical Manager along with a draft version of this Work Plan. The final version of the APP will incorporate any pending NAE comments and will be submitted electronically prior to the commencement of field efforts.

The APP addresses AECOM-specific policies and procedures that must be followed over the course of the field program, and should be considered a “living document” that can be updated based on changing site conditions. Task-specific AHA documents have been prepared, for use in the field for each major phase of work to be completed. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform the work. The analysis defines all activities to be performed, identifies the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Prior to the commencement of any field work, the training records for all staff (AECOM and subcontractors) proposed to be utilized on this program will be reviewed to ensure that they are current.

The SSHO for this project is Ms. Paula Winchell. Ms. Winchell will be responsible for general day-to-day health and safety of AECOM field personnel and subcontractors, ensuring that all AECOM Field Team staff participate in daily tailgate/ dockside safety meetings, ensuring correct usage of personal protective equipment (PPE) by field staff, and monitoring of field activities for adherence to the APP (and Work Plan). Ms. Winchell will also be responsible for hosting a project Healthy and Safety kickoff meeting for all staff prior to mobilization.

In the event of an incident, Ms. Winchell is responsible for initial response protocols, incident management, and proper reporting. Ms. Winchell and all field staff have “Stop Work Authority” in the event an employee identifies a condition or act that is likely to cause an Imminent Danger situation.

All safety meetings/ briefings will be documented and submitted to the NAE as part of standard reporting procedures. AECOM will complete the “USACE Contractor Monthly Summary Record of Injuries/ Illness and Work Hour Exposure” log (for prime and its subcontractors) and electronically submit the completed form to the Environmental Resources Section (ERS) project manager (R. Ben Loyd) and the NAE Safety and Occupational Health Office (Sheila Harvey) no later than the 5th calendar day of the following month. This form shall be submitted during months with active field efforts.

A.3.3 Project Mobilization

Upon NAE’s approval of this Work Plan and project APP, the project team will mobilize to the field in order to:

- receive NAE-collected sediments and water samples from the New Haven Harbor dredge site; and,
- to collect surface sediment and seawater samples at the CLDS Reference Site; and,
- to deliver the harbor and reference site samples to the analytical laboratories.

Following the collection of sediment and water samples, sample compositing, sample preparation and sample analyses will commence at the selected project laboratories (i.e. at ESI [sample compositing, elutriate preparation, SPP Assays, 10-Day Toxicity Testing and 28-Day Bioaccumulation Testing] and at Alpha [bulk sediment chemistry, elutriate chemistry and tissue chemistry]).

Table A-1 New Haven Harbor (NAE Sampling Locations) – Coordinates / Estimated Penetration / Sample Quantities

TABLE A-1: SAMPLING LOCATIONS - COORDINATES / ESTIMATED PENETRATION/ SAMPLE QUANTITIES (Adapted from USACE NHH PWS)														
Sample ID	Composite ID	Latitude	Longitude	Survey Depth (FT MLLW)	Project Depth + Overdepth (FT MLLW)	Estimated Core Length (FT)	Estimated Volume Per Core (Gallons) *	Minimum Sample Volume per Location (Gallons) **	Estimated Minimum Number of Buckets / Carboys ***	Required Analyses				
										Bulk Chemistry	Elutriate Testing	Suspended Phase Toxicity	10-Day Whole Sediment Tox.	28-Day Bioaccum. Test
V'	1	41.294024	-72.909459	-36.0	-42.0	6.0	2.2	3.0	1/3	X				
W'	1	41.293841	-72.907753	-36.8	-42.0	5.2	1.9	3.0	1/3	X	X	X		
R'	2	41.292011	-72.909869	-37.6	-42.0	4.4	1.6	13.0	4/4	X				
S'	2	41.291829	-72.908069	-38.7	-42.0	3.3	1.2	13.0	4/4	X	X	X	X	X
US-1	3	41.295908	-72.908872	-38.3	-42.0	3.7	1.4	13.0	4/4	X				
US-2	3	41.295277	-72.907473	-37.9	-42.0	4.1	1.5	13.0	4/4	X	X	X	X	X
DS-1	4	41.289914	-72.910146	-37.3	-42.0	4.7	1.7	12.0	4/3	X				
DS-2	4	41.289682	-72.908491	-35.8	-42.0	6.2	2.3	12.0	4/3	X	X	X	X	X
TB-1	5	41.290146	-72.911912	-36.1	-42.0	5.9	2.2	12.0	4/3	X				
TB-2	5	41.291600	-72.911632	-35.5	-42.0	6.5	2.4	12.0	4/3	X	X	X	X	X
CAD-1	6	41.267153	-72.915138	-8.0	TBD	10.0+	3.7	8.0	3/2	X				
CAD-2	6	41.266433	-72.916180	-6.0	TBD	10.0+	3.7	8.0	3/2	X	X	X	X	X
CAD-3	6	41.265541	-72.915376	-9.0	TBD	10.0+	3.7	8.0	3/2	X				

* Volume estimated assuming 3" inner diameter core liners for dredge area sediment samples

** Assumes 23 gallons of sediment per composite (25 gallons at QC stations) for testing and archiving unless otherwise specified. QC stations may change; however, QC samples are depicted at Stations 2 and 3 in this example. Sediment cores for bulk chemistry are not included in volume calculations.

*** 28 gallons of dredge site water will be collected from a central location in the vicinity of each composite group (37 gallons to be collected at QC stations). QC stations may change; however, QC samples are depicted at Stations 2 and 3 in this example.

Sample containers for dredge area sediments shall be 3.5 gallon food grade high density polyethylene pails with locking lids (Grainger® item numbers 49EN25 and 49EN23 or equivalent). Sample containers for dredge area water shall be 5 gallon food grade collapsible carboys (Grainger® item number 9LA45 or equivalent).

Table A-2 Example Composite IDs and Water Sample IDs/ Volumes Used to Prepare the Elutriate and SPP Mixtures

Sample ID~	Water Sample ID Used for Elutriate/SPP Mixture~	Expected Composite ID~	Minimum Water Sample Volume Required (gal)+	Anticipated Sediment Sample Volume+ (gal)
V;	NHHSW-1	1**	28	6***
W'				
R'	NHHSW-2	2**	37	25
S'				
US-1	NHHSW-3	3**	37	25
US-2				
DS-1	NHHSW-4	4**	28	23
DS-2				
TB-1	NHHSW-5	5**	28	23
TB-2				
CAD-1	NHHSW-6	6**	28	23
CAD-2				
CAD-3				
NHHS-CLDS*	NHHSW-CLDS	NHHSW-CLDS	45 (plus 7 gallons collected in laboratory glassware)	18

~ Sample IDs to be assigned by NAE.
 * CLDS Reference Site locations.
 + Sediment composite and water sample volumes reflected in the PWS (NAE, 2018) have been amended to account for material volume details provided by the ESI and Alpha Project Managers on 8/30/18 and 10/15/18.
 ** Based on field conditions, QC samples may be obtained from alternate composites. Sufficient volumes for project QC obtained from Composite 2 and 3 in the above example.
 *** No 10-Day or 28-Day Sediment Toxicity to be performed on Composite 1 materials

Data gathered in the tasks described herein will be evaluated to assess the suitability of the material for unconfined open water disposal and potential risks to marine life posed by the material to be dredged:

- Aquatic life exposures** may be assessed with a chemistry screening approach, but are generally modeled using a mixture of seawater and the material to be dredged corresponding to standard chemical elutriates and SPP samples (Tasks 6, 7 and 7.1). Chemical elutriate results are used to ensure that Ambient Water Quality Criteria (AWQC) will not be exceeded at the dredged material placement site (CLDS) four hours after discharge, or outside of the site boundary at any time. SPP toxicity testing results are used to develop a Limiting Permissible Concentration (LPC), and, based on regulatory modelling by ADDAMS/ STFATE, are also used to determine Marine Protection, Research, and Sanctuaries Act (MPRSA) §103 water column compliance. SPP toxicity tests include three species: a fish, a mysid shrimp, and a sea urchin (Task 7). These species are sensitive to multiple parameters, including ammonia levels which may be elevated in the elutriates. If elevated ammonia levels are measured in the SPP tests, then these tests will be repeated with new elutriates prepared after an ammonia reduction procedure is implemented (see Section B.7.2).
- Whole sediment exposure** will be assessed with whole-sediment bioassay data (Task 8) and bioaccumulation data (Tasks 9 and 10). The RIM (EPA/ USACE, 2004) summarizes the wide range of parameters included in the assessment. The biological testing incorporates aquatic

organisms (i.e. amphipod and shrimp; clam and worm) to identify the potential impacts to sediment-associated organisms.

A.3.4 Applicable Regulations/ Standards

This project has been designed to collect environmental data needed to characterize the sediment to be dredged, and determine suitability for placement unconfined in the marine environment under MPRSA §103, detailed in the Ocean Dumping Regulations (Title 40, Code of Federal Regulations, [CFR] 220-229). As such, the work will be guided by NAE's *Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters* (RIM, EPA/ USACE, 2004), the *Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual* (Green Book, EPA/ USACE, 1991), and the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.* (Inland Testing Manual, EPA/ USACE, 1998). These regulations are adhered to within the jurisdictional area of the NAE by the RIM and the laws and regulations of Connecticut (where this proposed project is located).

A.3.5 Project Schedule

The sampling schedule is provided in **Table A-3** along with project milestones and deliverables.

A.4 Non-measurement Data Acquisition

AECOM anticipates that relevant grain size or other site information reviewed by NAE for planning purposes would be available if needed.

A.5 Field Activities

The New Haven Harbor dredged material suitability determination field program will be completed by NAE personnel and by the AECOM Field Team (AECOM and OSI personnel). AECOM Field Team activities include: collection of sediment and water samples from the CLDS Reference Site; as well as receipt and delivery of NAE-collected representative sediment and water samples from New Haven Harbor.

Field activities described herein focus primarily on AECOM Field Team activities. Sampling techniques and SOPs to be employed by NAE personnel, relative to sediment and water collection activities within the New Haven Harbor proposed navigation improvement project, are addressed in detail under separate cover (NAE Sampling and Analysis Plan).

The sampling approach selected by NAE to meet the project objectives requires the collection of the following sample types:

- New Haven Harbor sediment cores to be collected and composited by NAE (13 stations / 6 composites)
- New Haven Harbor water samples to be collected by NAE (Central location to each composite). Single- to multiple-depth seawater collection at the New Haven Harbor sampling stations (by NAE) [composite of surface, mid-depth, and bottom water (3-feet above) when overlying water depth > 30 ft. MLLW, and collection at mid-depth only for overlying water depths < 30 ft. MLLW].
- CLDS Reference Site sediment grab sampling by the AECOM Field Team
- CLDS Reference Site water sampling by the AECOM Team at near surface (3-feet below) or mid-depth prior to the collection of the sediment samples¹.

¹ In contrast to the PWS language regarding sampling depths; but, in accordance with RIM guidance and NAE Technical Manager guidance (15 October 2018). RIM Section 4.5 states "*Dilution water is used in water column toxicity tests to make up the required dilutions. It must be clean seawater, appropriately aged*

A.5.1 New Haven Harbor Proposed FNP and CLDS Reference Site Sediment

Sediment within the proposed FNP will be cored by NAE to the authorized depth (plus allowable over dredge) to fully characterize the sediment prism that requires removal/dredging. The dredge site sediments will be used in the bulk sediment chemistry, toxicity testing, bioaccumulation testing and associated analyses.

At the reference site, only the surface sediment character is relevant for comparison purposes. As such, a grab sampler is the sampling equipment of choice. The CLDS Reference Site sediments will be used in the toxicity testing, bioaccumulation testing and associated analyses.

This section details the locations, composite preparation, field and laboratory measurements, and QC sampling requirements.

A.5.1.1 Coring Collection Locations

NAE has determined that 13 sampling stations are sufficient to further characterize the proposed navigation project to be dredged. New Haven Harbor sediment core samples will be collected by NAE sampling personnel. Station positions are detailed on **Table A-1** and depicted on **Figure A-2**.

artificial seawater, or seawater collected from the disposal site reference location at near surface or mid-depth prior to collection of the sediment samples."

Table A-3 Milestones & Deliverables Schedule (With Anticipated SPP Optional Task Flow & Timing Details)

Task	Milestone ¹	Schedule*
	TASK NOTICE TO PROCEED	21 September 18
	PLANNING	
1, 2	SAP & APP preparation	24 September 18 - 15 October 18
	DRAFT SAP delivered to NAE	15 October 18
	DRAFT APP delivered to NAE	12 October 18
	NAE SAP & APP review, AECOM finalizes, NAE approves SAP & APP	19 October 18
	SAMPLE COLLECTION	
3	Field Effort: 3 day effort - NAE New Haven Harbor FNP sampling surveys	22-24 October 18
	Field Effort: 3 day effort - AECOM receives NAE-collected sediment and water samples	22-24 October 18
	Field Effort: 1-day CLDS Ref sediment and water sample collection	23 October 18
4	AECOM transport and deliver samples to ESI / ESI Initiate sample processing	23 - 25 October 18
	Submit Field Report (Incl. Sample Logs and COCs) to NAE	01 November 18
5	BULK SEDIMENT CHEMISTRY	
	Bulk Sediment Chemistry – samples by courier to Alpha	24 October 18
	Bulk Sediment Chemistry Progress Report and EDD delivered to NAE	21 November 18
6	ELUTRIATE CHEMISTRY & SUSPENDED PARTICULATE PHASE TESTING	
	Elutriate Preparation	24 & 25 October 18
	Start Elutriate Chemistry (plus ambient water) – Samples by courier to Alpha	25 & 26 October 18
	Elutriate/Site Water Progress Report and EDD delivered to NAE	27 November 18
7	SPP BIOASSAY (Prepare Elutriates)	24 & 25 October 18
	Ammonia readings / Ammonia reduction Discussions	25 & 26 October 18
	Introduce Organisms (Once Approved / Acceptable conditions met)	25 & 26 October 18
	SPP bioassay – ammonia reduction OPTION	Notify NAE within 24 hours of ammonia threshold exceedance / need for option
	Initiate Ferretti Method	26 & 27/29 October 18
	SPP progress report delivered to NAE (without statistical analysis)	Within 1 week of test completion
8	10-DAY WHOLE SEDIMENT ACUTE TOXICITY BIOASSAY	
	Samples loaded, ammonia equilibration	28 November 18
	10-day bioassay testing	05 December 18
	10-day whole sediment bioassay written progress report delivered to NAE	04 January 19
9	28-DAY BIOACCUMULATION	
	28-day Bioaccumulation testing initiation	05 December 18**
	28-day Bioaccumulation testing conclusion	02 January 19**
	28-day Bioaccumulation Progress Report delivered to NAE	30 January 19
10	TISSUE ANALYSIS	
	Tissue Analysis	04 January 19**
	Tissue Analysis Progress Report and EDD delivered to NAE	15 February 19**
	Tissue Analysis statistics complete	01 March 19
11	FINAL REPORT	
	Draft Final Report delivered to NAE	14 March 19
	Final Report delivered to NAE	Within 7 days of receipt of NAE comments

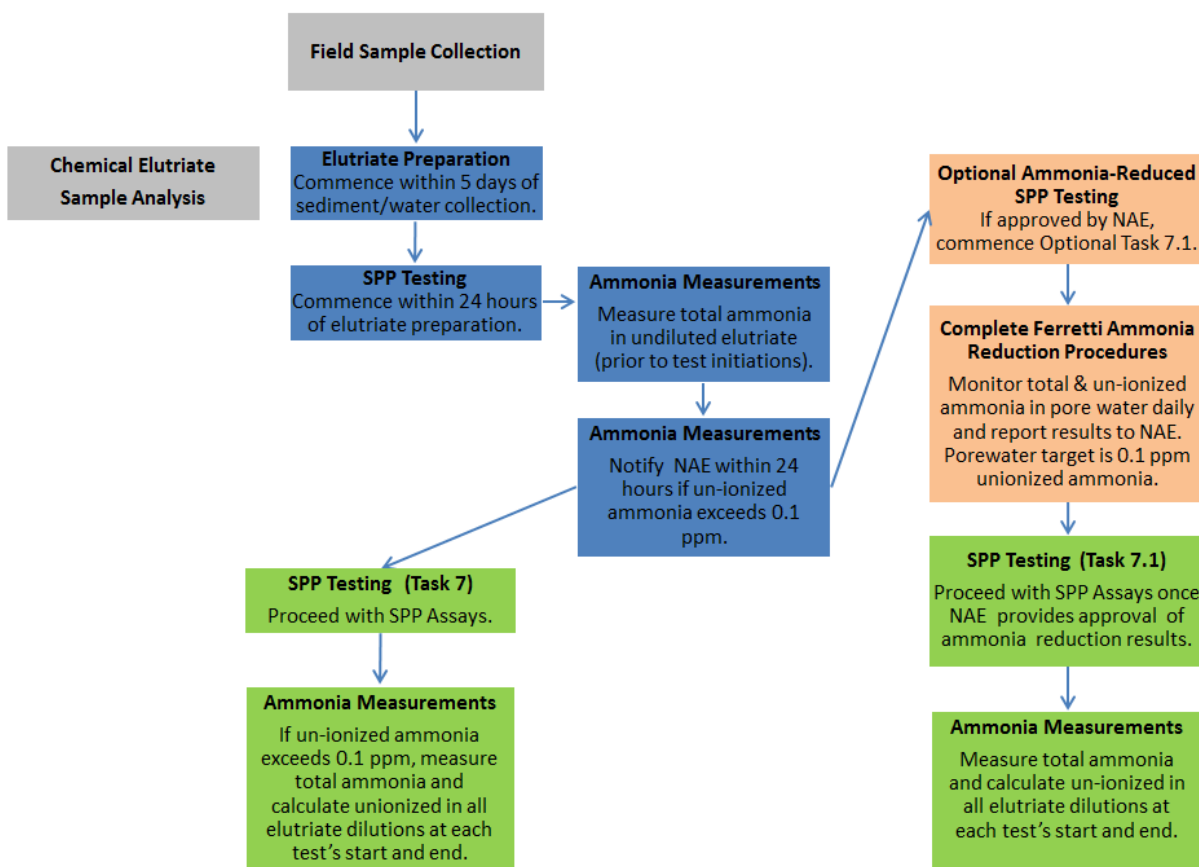
¹NAE Deliverables are bolded

* Anticipated on or before.

**Schedule as per PWS delivery schedule constraints and anticipated field sampling dates. 28-Day Assay & Tissue Analysis may need to start earlier than dates shown, in order to meet the required interim tissue report delivery date, as

Task	Milestone ¹	Schedule*
shown (assuming a 3-week standard tissue analysis TAT).		

Optional Task 7.1: Anticipated Flow and Timing Detail



Task Reporting– See Accompanying Delivery Schedule Table

Action	Sample Delivery Batch 1	Sample Delivery Batch 2
NAE Sediment Collection	Monday & Tuesday (10/22 & 10/23)	Wednesday (10/24)
NAE Dredge Site Water Collection (14 day hold)	Monday (10/22)	Monday (10/22)
CLDS Water Collection (14 day hold)	Tuesday (10/23)	Tuesday (10/23)
Sample Delivery to ESI	Wednesday Morning (Sediment & Waters: 10/24)	Thursday Morning (Sediment Only: 10/25)
Prepare Elutriates	Wednesday (10/24)	Thursday (10/25)
Alpha Chemical Elutriate Courier (Hex Cr – 24 Hr.)	Thursday (10/25)	Friday (10/26)
Ammonia Elutriate Readings	Thursday (10/25)	Friday (10/26)
Introduce SPP Organisms	Thursday (10/25)	Friday (10/26)
Ferretti Contracting Discussions/Decision	Thursday (10/25)	Friday (10/26)
Initiate Ferretti Method	Friday (10/26)	Saturday (10/27)/ Monday (10/29)

To expedite the biological assay processing and to meet the project schedule constraints outlined herein, the AECOM team anticipates completing two sample deliveries to the toxicology laboratory, as outlined above.

Receipt of the CLDS and Dredge Site waters in the first delivery will be required by the laboratory. Further, provision of waters collected on the program's sampling "Day 2" (i.e. as listed as Tuesday 10/23/18, above) will allow the greatest balance between test initiation constraints (5 days) and water hold time constraints (14 days).

Figure A-2 New Haven Harbor Proposed Navigation Project [Figure from PWS, NAE, 2018]

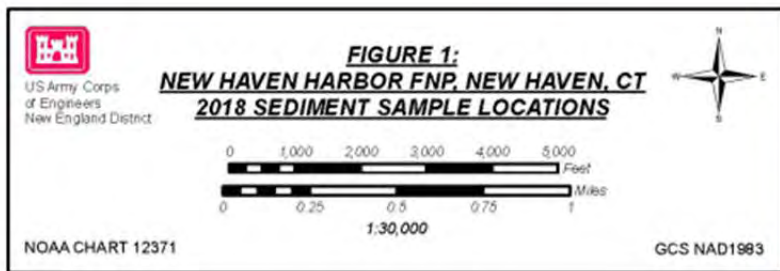
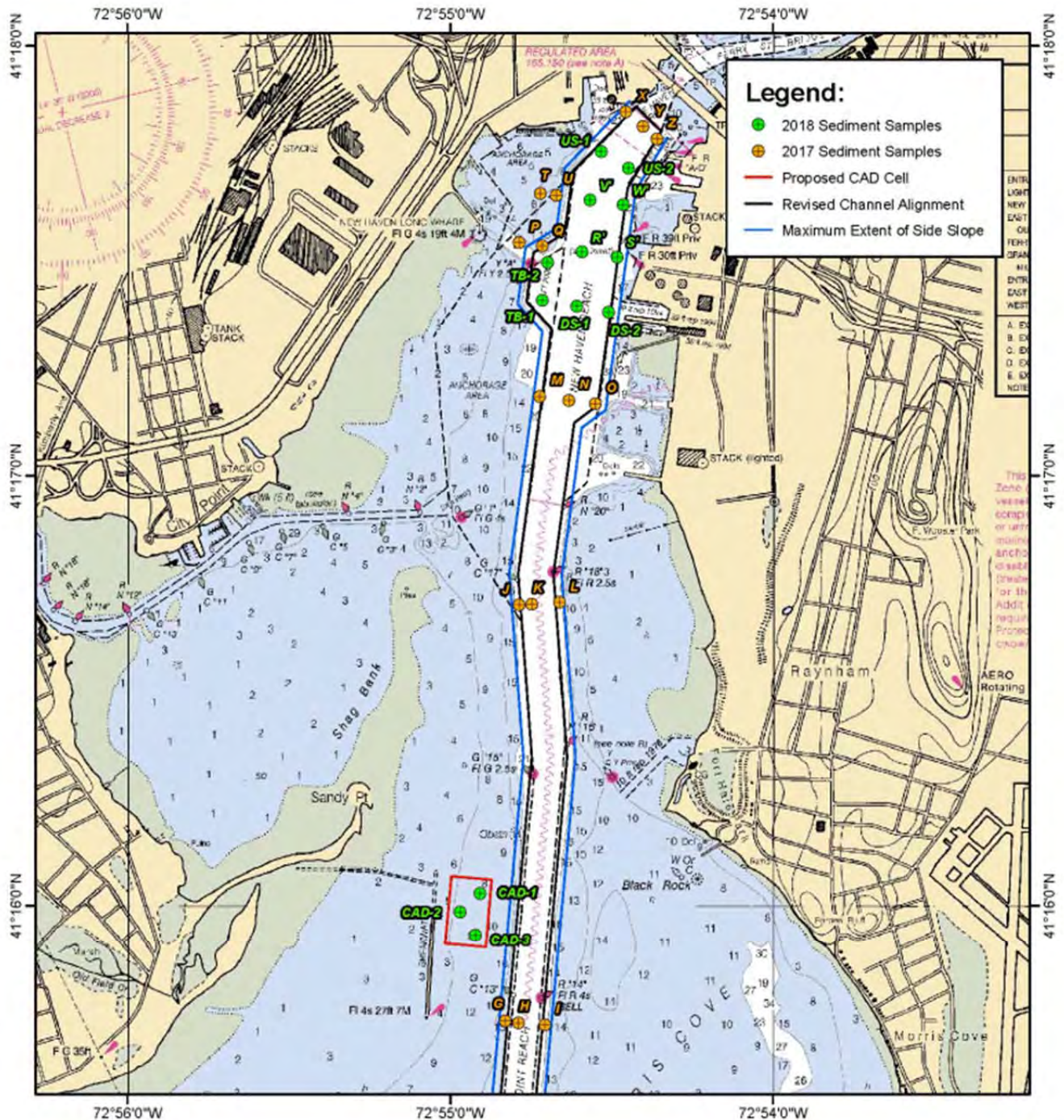
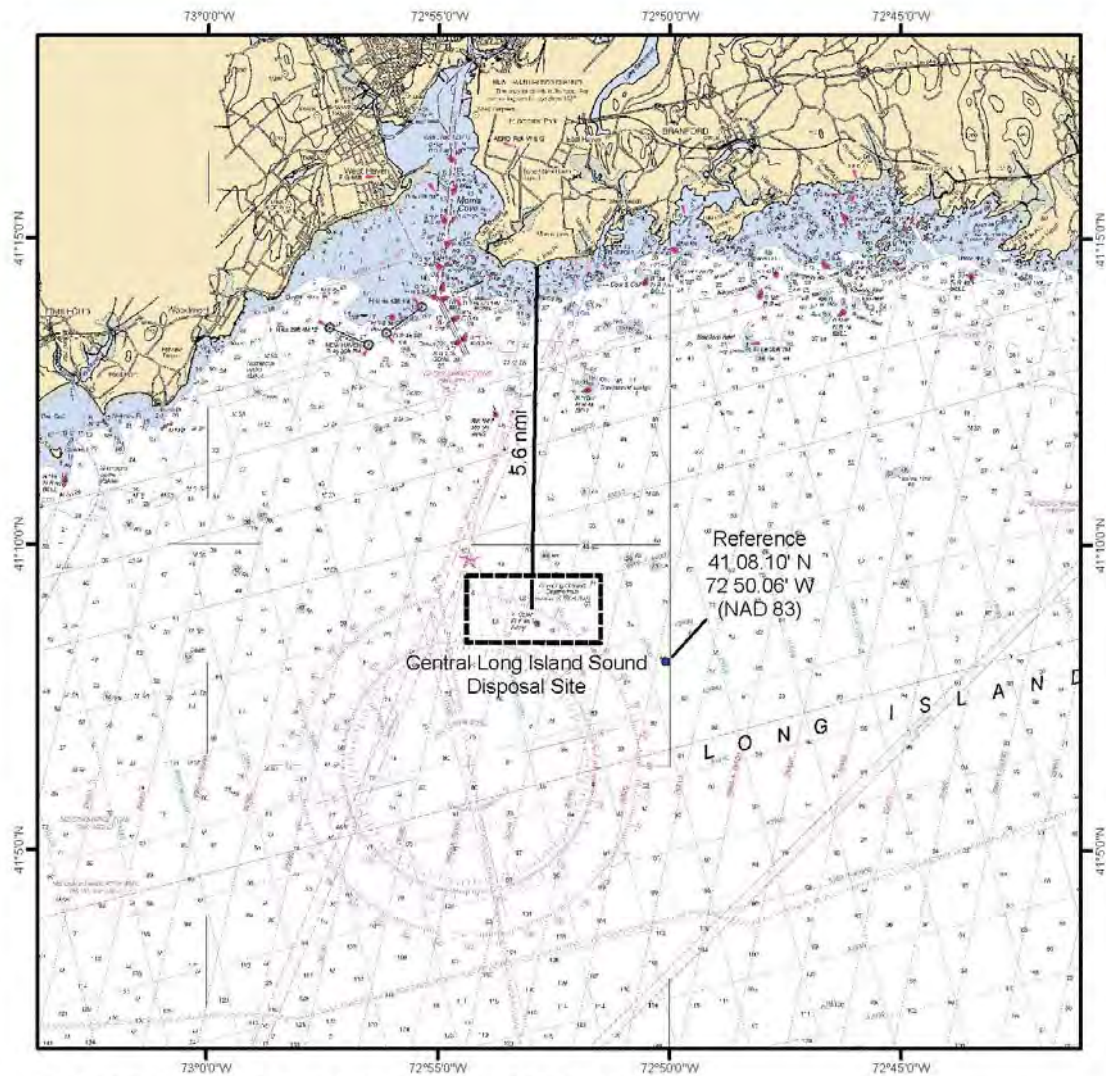
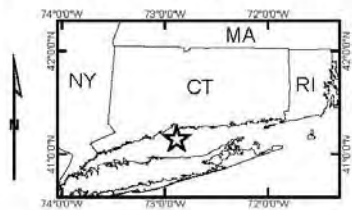
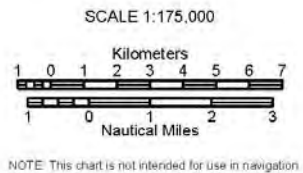
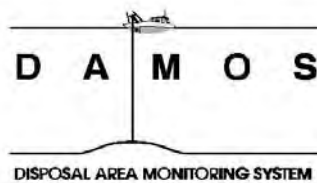


Figure A-3 CLDS Reference Site (Figure from PWS, NAE 2018)



CENTRAL LONG ISLAND SOUND DISPOSAL SITE

Description: The Central Long Island Sound Disposal Site (CLDS) is one of four regional dredged material disposal sites located in the waters of Long Island Sound. CLDS covers a 11.04 km² (3.2 nm²) area and is centered at 41° 08.950' N, 72° 52.950' W (NAD 83). It is located approximately 10.89 km (5.6 nmi) south of South End Point, East Haven, Connecticut. Since 1977, the management strategy at CLDS has entailed the controlled placement of small to moderate volumes of sediment to form individual disposal mounds on the seafloor. The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents.



A.5.1.2 Discrete/Composite Sediment Sampling Requirements

Initially, the NAE-collected cores will be processed aboard the NAE sampling vessel (or on shore by NAE) and will be transferred to appropriate sample containers (provided by the AECOM Field Team). Sediments will be transferred from NAE to AECOM in the provided containers under chain of custody (see SOP ES-G-04). The sediment volume needed from each station and stations that will be pooled together by NAE to form composites, as detailed on **Table A-1**. Additionally, the sample volumes needed for the array of testing parameters are detailed on **Table A-4** *Sample Mass/ Volume Requirements*.

Biological laboratory composite preparation procedures are detailed in Section B of this Work Plan (QAPP).

Table A-4 Sample Mass/ Volume Requirements (minimum)

Parameter	Units	Sediment Volume		Water Volume		Prepared Elutriate Volume	
		New Haven Harbor (Per Tested Sample or Composite)	CLDS Reference Site	New Haven Harbor Dredge Site (Per Composite)	CLDS Reference Site (Total)	New Haven Harbor Dredge Site (Per Composite)	New Haven Harbor Dredge Site QC (two sets)
Chemistry Testing Parameters – Bulk Sediment							
Bulk Sediment Chemistry*****	L	0.25 (8 Oz Jars provided to NAE)	-	-	-	-	-
Chemistry Testing Parameters - Elutriate*							
Elutriate Chemistry - Prepared Elutriate**	L	12	-	48	-	21	-
Elutriate Chemistry - Prepared Elutriate for QC samples***	L	9 (18 for project)***	-	32 (64 for project)***	-	-	18 (36 for project)***
Chemistry Testing Parameters – Surface Waters							
Elutriate Blank Chemistry (Centrifuged Dredge Site Water)**	L	-	-	25	-	-	-
Reference Site Chemistry (Surface water or Mid-Depth Water)**	L	-	-	-	25 Collected in laboratory glassware	-	-
Toxicity Testing Parameters*							
SPP Toxicity Bioassay	L	4	-	16	72	8	-
SPP Toxicity Bioassay – Ammonia Reduced	L	4	-	16	72	8	-
10-Day Whole Sediment Toxicity Bioassay	L	6	6	-	-	-	-
Bioaccumulation Testing Parameters							
<i>Nereis</i> 28-Day Study	L	30	30	-	-	-	-
<i>Macoma</i> 28-Day Study	L	30	30	-	-	-	-
Total Volumes Required							
Bulk Sample Volume (L)	L	86 Per Sample [95 per QC sample]****	66 Total	106 Per Sample [137 per QC sample]****	170 Total (including above glassware)	37 Per Sample	18 Per Sample (2 for QC)
Bulk Sample Volume (Gal)	Gal	23 Per Sample [25 per QC sample]****	18 Total	28 [37 per QC sample]****	45 Total (including above glassware)	10 Per Sample	5 Per Sample (2 for QC)

Footnotes:

* In order to achieve the volumes of elutriate required for chemistry and biological (SPP) testing, the elutriate preparation methods assumes an ~50% yield of final elutriate volume.

**Elutriates, elutriate blanks and reference site waters are analyzed in triplicate. A final volume of 7-L of elutriate is required per replicate for analysis. Volume presented represents 7 L or elutriate per replicate x 3 replicates for each

composite.

***Two sets of QC samples are required for the project; each set requires one MS/Dup (all parameters: 14-L) and one MSD (Organics only: 4-L) sample. Additional volume should be prepared from two separate composites to prepare sufficient volume for QC (i.e. prepare an additional 18-L from Comp 2 and an additional 18-L from Comp 3 in this example).

****Volume in parentheses includes material required at composites with associated QC samples (two/project).

*****AECOM anticipates that NAE will collect 22 sets of bulk sediment chemistry for project analysis.

A.5.1.3 Sample Collection and Field & Laboratory Analysis

Navigation. Vessel positioning for all sediment collections will be accomplished utilizing a Differential Global Positioning System (DGPS) Integrated with HYPACK software with an accuracy of 3 meters or less according to AECOM SOP ES-G-02 (Appendix A). Local tide data will be obtained to calculate tidal height in feet above MLLW. The reference site target distance is defined as up to 250 feet from the sampling coordinate. Consultation with the Task Order Manager will be attempted prior to collection of materials from beyond this distance (if further relocation is required, based on benthic conditions). All coordinate data shall be reported in geographic NAD 83 decimal degrees. All depth data shall be reported in tenths of feet.

Care will be taken to avoid sample contamination from sampling gear, airborne dust, vessel engine exhaust, cross contamination, etc. If wind/current/ traffic conditions allow, engines will be shut off during sampling; otherwise, sampling will be performed upwind of exhaust and contamination sources. Final sample mixing will be performed in the laboratory for greater contamination control.

Collection & Analysis. The harbor locations will be cored by NAE using vibracoring equipment according to the NAE SAP/SOPs. Grab samples of the surface sediment from the CLDS Reference Site and will be collected using a Ponar, Ted Young modified Van Veen grab sampler, or equivalent, in accordance with AECOM SOP ES-S-01 (Appendix A). **Table A-5** lists the equipment intended for use during project performance and equipment calibration /checking requirements are detailed in **Table A-6**.

Table A-5 Proposed Sampling Gear for the CLDS Sampling Task

Equipment	Description	Objective
Sampling Vessel	27-foot Forward Cabin Power Boat	Reference station sampling
Refrigerated Storage Vehicle	16 foot Refrigerated Box Truck, Refrigerated Van, or equivalent	Chilled sample storage during the field program
DGPS	Sub-meter GPS with Hypack Survey Software or equivalent	Vessel positioning and data collection
Grab Sampler	Ted Young modified Van Veen (0.1 meter squared) Grab Sampler or Equivalent	Reference sediment collection
30L Niskin Bottle	Messenger activated sampling bottle for specified depths	CLDS reference site water collections

Table A-6 Field Instrument Calibration, Checking, and Corrective Action

Parameter/ Instrument	Calibration Frequency	Calibration Standards	Acceptance Criteria/ Corrective Action
Water Depths Non-contaminating weighted line. and, Lowrance X50DS Sounder (or equivalent)	Initial: Each time instrument is turned on.	Deployable metal plate and metering line	Within 10% of metering line instrument will be replaced.
Station Locations Trimble DGPS System w/ Hypack	Initial: Start of field program	Survey of benchmark	3 meter accuracy minimum or GPs to be replaced
	Check: Daily	Survey of benchmark	
Sample Temperature Refrigerated Truck Storage	Check twice daily	Alternate thermometer	Vehicle gauge within 0.5°C of the hand-held monitoring thermometer. Re-calibrate stationary thermometer as needed.

Samples will be chilled on wet ice while on board the vessel and subsequently transferred to a refrigerated box truck/van daily during field operations. The temperature in the refrigerated vehicle will be regularly monitored to ensure that the storage temperature is maintained at 4° Celsius (C) ±2° C. Upon completion of the NAE New Haven Harbor sediment coring activities, NAE will place core contents into pre-provided containers. AECOM personnel will accept custody of the harbor sediment and water from NAE at the end of each sampling day (SOP ES-G-04) and place into the refrigerated vehicle.

In addition, the AECOM driver will accept custody of the reference site sediment and water samples from the AECOM Field Team (SOP ES-G-04) and place into the refrigerated vehicle. Samples will be delivered to the toxicology laboratory at the end of two field sampling days, as specified in Table A-3. AECOM anticipates one sample deliver to occur mid-way through the program, and one sample delivery at the end of the sampling program. Chemical laboratory courier service will also be coordinated by AECOM and te project laboratories.

Sample collections will be recorded on the Daily Activity Log (Attachment 3). Project documentation requirements are provided in Section A.6.

Bulk sediment chemistry samples will be collected by NAE in the field.

Composite samples for project toxicology and elutriate analysis will be prepared at the laboratory. After the sample composites are prepared, the elutriate chemistry (metals, polychlorinated biphenyls [PCBs], pesticides, and pentachlorophenol), biological tests (SPP, 10-day whole sediment acute toxicity) and 28-Day bioaccumulation testing associated tissue chemistry will proceed. Refer to the task order QAPP (Section B) for a listing of the detailed parameters and species to be tested. The project will follow the schedule presented in **Table A-3**.

Table A-7 Sample Container, Preservations, and Holding Time Requirements

Sediment Parameters	Volume/Mass	Container	Preservation	Storage	Holding Time
Bulk Chemical/ Biological Testing Material	3.5-Gal Buckets (see Tables A-2 and A-4 for volume)	Plastic	Fill Completely	4°C dark/airtight	14 days (d) recommended, no longer than 56 days (d)

Aqueous Parameters	Volume/Mass	Container	Preservation	Storage	Holding Time
Metals	2-liter (L)	Plastic	HNO ₃ to pH<2	4±2 °C	28 d (Hg) 180 d (other metals)
Hexavalent Chromium	1-L	Plastic	Chill	4±2 °C	24 hours
Pentachlorophenol	2-L	Amber Glass	Chill	4±2 °C	7 d (extract)/ 40 d (analyze)
Pesticides	2-L	Amber Glass	Chill	4±2 °C	7 d (extract)/ 40 d (analyze)
PCBs	2-L	Amber Glass	Chill	4±2 °C	7 d (extract)/ 40 d (analyze)
Bulk Chemical/ Biological Testing Material	5-Gal Cubitainers (see Tables A-2 and A-4 for volume)	Plastic	Fill Completely	4°C dark/airtight	14 d

A.5.1.4 QC Samples & Frequency

Contamination control is one of the important aspects of environmental sample collection efforts. For this reason, equipment blank QC samples will be collected from all equipment that comes in contact with the sediment and surface water samples.

A total of two sediment and two water equipment blanks will be collected during the program:

- One equipment rinse blank will be collected by NAE from the New Haven Harbor site coring equipment;
- One equipment rinse blank will be collected by NAE from the New Haven Harbor site water sampling equipment;
- One equipment rinse blank will be collected by the AECOM Team from the CLDS grab sampling equipment; and
- One equipment rinse blank will be collected by the AECOM Team from the CLDS water sampling equipment.

In each case, high purity deionized water (DIW) will be poured over clean (i.e., decontaminated per SOP ES-G-03) collection equipment (e.g., surface water sampling bottle, core liners, cutters, catchers, and processing utensils or grab sampler) or run through the pump/Niskin bottle, and collected in a chemistry container set.

A standard set of laboratory QC will be included in the analytical program as defined in the QAPP, but will not require any additional volume collected during field operations beyond those mass/volumes already specified (**Table A-2** and **Table A-4**).

A.5.1.5 Sample Containers and Preservation Techniques

The sediment storage containers specified for the project are provided on **Table A-7**. Large/ bulk sediment samples will be transferred to food-grade plastic (high density polyethylene) 3.5 gallon buckets. Seawater samples will be stored in 5-gallon collapsible carboys (food-grade cubitainers). All samples will be transferred to a refrigerated storage truck / van on shore.

A.5.1.6 Decontamination Procedures

The sediment coring equipment will be decontaminated as appropriate by NAE. The grab sampler utilized by the AECOM Team will be cleaned thoroughly to remove any dust/ film before the reference sediment is collected. Level 1 decontamination procedures (SOP ES-G-03) applied to sediment collection equipment (grab sampler) corresponds to the following procedure:

- Non-phosphate soap solution wash/ brush-down;
- Thorough rinse with site water

Re-cleaning between discrete grab samples at the CLDS Reference Site will not be necessary unless the grab sampler is compromised in some way as determined by the field scientist (e.g., rinsing residual sediment from the grab using the deck-hose with reference site water). Stainless steel spoons used to homogenize the sediment will be cleaned in the same manner.

A.5.2 New Haven Harbor Proposed FNP Site and CLDS Reference Sites Water

As required by the PWS (NAE, 2018), seawater from the harbor will be used in the preparation of chemical elutriates. Water samples will be collected using either a non-contaminating pump with program dedicated tubing, or a decontaminated discrete grab water sampler per the applicable SOPs. Given the inherent purity of seawater, collection and handling procedures must follow strict contamination control procedures as discussed in this section.

Seawater from the CLDS Reference Site will be collected using a large-volume (30L) Niskin bottle and used for preparing the SPP toxicity testing dilution series (dilutions of elutriate samples with CLDS water).

A.5.2.1 Water Collection Locations

Dredge site water will be collected by NAE from a point centrally located in each composite sample area, as noted in Tables A-1 and A-2.

If possible, dredge site water collection should be completed by NAE on an incoming tide, in order to ensure appropriate salinity (25 to 30 ‰) is achieved. In the event that field testing confirms that the New Haven Harbor dredge site waters are too fresh, NAE should subsequently collect the above-noted volumes from an appropriate source of clean (salty) seawater.

CLDS Reference Site seawater will be collected by the AECOM Team for SPP dilution series preparations and for chemical analysis. CLDS Reference site water will be collected from near-surface or at mid-depth, in accordance with the RIM.

A.5.2.2 Water Sampling Requirements

As indicated above, water samples will be collected to support the required laboratory testing. To meet the range of testing requirements, an appropriate volume of seawater will be collected from the harbor and from the CLDS Reference Site, as depicted in **Table A-2** and **Table A-4**.

A.5.2.3 Sample Collection and Field & Laboratory Analysis

Navigation. The same navigation equipment and protocol used for the sediment collection effort (i.e. as outlined in Section A.5.1.3) will be used for the water collection effort (AECOM SOP ES-G-02; Appendix A).

Seawater Collection. Seawater from the harbor area (site water collected by NAE) and the reference area (water collected by the AECOM Team for SPP dilutions and chemical analysis) will be collected using a pre-cleaned large-volume Niskin bottle, at the sampling depths outlined in Section 5.1, above.

CLDS Reference Site water collections will be performed according to SOP ES-W-01 (Appendix A). The volume to be collected at each proposed location is detailed in **Table A-2** and **Table A-4**. AECOM will record reference area water collections in the field log book and on daily activity logs (Attachment 3). Pertinent field observations (turbidity, sheen, blooms, etc.) will also be recorded on the field collection log. Project documentation requirements are provided in Section A.6.

In the evening of the final water collection field day (or first thing the following day, depending upon sampling timing), all samples will be transferred to the biological laboratory (ESI) using the refrigerated storage vehicle. The off-water timing (i.e. AECOM's return to the dock) and laboratory hours of operation may require that the samples be delivered to ESI the first thing the following morning. Sample preparations may then begin, to ensure adherence to the PWS schedule constraints and the 14-day hold time for all surface water to be used in the elutriate preparation and the SPP bioassays.

A.5.2.4 QC Samples and Frequency

QC sampling of the water collection program will include collection of equipment blanks during the field effort to verify operation cleanliness. Additional information pertaining to the anticipated QC sampling is presented in Section A.5.1.4

A standard set of analytical QC samples will be included in the laboratory analysis program, but additional volume beyond that already specified (**Table A-4**) is not anticipated.

A.5.2.5 Sample Containers and Preservation Techniques

Water samples collected in the field will be contained in clean, new five gallon plastic cubitainers and placed on ice for preservation. Discrete seawater samples for rinsate blanks will be contained in smaller plastic (metals) and glass (trace organics) bottles. Water sample containerization and preservation requirements are detailed on **Table A-7**. In addition to icing immediately following collection, the water samples will be transferred to the refrigerated box truck /van upon returning to the dock.

A.5.2.6 Decontamination Procedures

The water sampler used to collect the CLDS waters will be cleaned prior to use in the following manner:

- Deionized water (DIW) rinse
- Dilute Liquinox™ rinse
- DIW rinse

A.6 Field Operations Documentation

AECOM's field documentation will include grab sampling logs, with narratives describing relative grain sizes, color, odor, and depth of penetration along with other pertinent sediment sampling observations. Seawater collection data (profile information, unique observations) will be recorded in the field logbook. Project field records will be documented and maintained in accordance with AECOM SOP ES-G-01 (Appendix A).

The full range of information to be included in field records is provided in AECOM SOP ES-G-01 (Appendix A). Field documents developed for this task are provided as Attachments.

A.6.1 Field Logbook and Field Sheets

Field logbooks will provide the means of recording the data collection activities performed during the investigation. As such, entries will be described in as much detail as possible so that persons reviewing site data can reconstruct a particular situation without reliance on memory.

Field logbooks will be bound field survey books or notebooks, and assigned to the field personnel, but will be stored in the project files when not in use. Each logbook will be identified by the project-specific document number.

The title page of each logbook will contain the following:

- Person to whom the logbook is assigned;
- The logbook number;
- Project name and number;
- Project start date; and
- End date.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, and the signature of the person making the entry will be entered. The names of any visitors and the purpose of their visit will also be recorded in the field logbook.

Field logbooks will be supplemented by standardized forms, such as daily activity logs (Attachment 3). All measurements made and samples collected will be promptly recorded. All entries will be made in permanent ink, signed, and dated, and no erasures or obliterations will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark that is initialed and dated by the sampler. Whenever a sample is collected, or a measurement is made, latitude and longitude information will be recorded. All equipment used to make measurements will be identified, along with time and date of calibration and checking.

A.6.2 Sample Documentation

The data management strategy for this task comprises the following elements:

- Assignment of unique sample codes. This code is used to track the sample from collection, through the analysis, to reporting.
- Data retention. Data will be retained in accordance with the requirements stated in Section A.6.2.4 of this Work Plan.

A.6.2.1 Sample Identification/Numbering

For each set of samples collected, the sample containers will be labeled with the following information:

- Project Name (New Haven Harbor Navigation Improvement Dredging Project Suitability Study 2018);
- Unique sample identification number
- Date and time of sample collection;
- Name or initials of collector;
- Sample preservation/storage condition; and
- Type of analysis (grain size, etc.).

QC samples will be labeled in the following manner:

- Equipment blanks: NH-EB-XXXX-mm/dd/yy where XXXX corresponds to the equipment type (either pump or grab) and mm/dd/yy corresponds to the collection date.
- Replicates: The sample identification (ID) is to be appended with “-Rep”

Water samples collected (by NAE) for preparation of elutriates will be labeled by NAE and water samples collected for chemical testing and the preparation of SPP/Elutriate dilution series mixtures (by AECOM Field Team) will be labeled MW-CLDS, as outlined in **Table A-2**.

A.6.2.2 Chain-of Custody Records

Custody is one of several factors necessary to satisfy the two major requirements for data admissibility: relevance and authenticity. Sample custody is addressed in two parts: field sample collection and laboratory analysis. Refer to AECOM SOP ES-G-04 (Appendix A) for further details.

The field team is personally responsible for the care and custody of the samples until they are transferred or dispatched properly to the laboratories. Field procedures have been designed such that as few people as possible will handle the samples.

All sample containers will be identified by the use of adhesive sample labels. Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.

Samples will be accompanied by properly completed COC forms. The sample codes will be listed on the COC form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location. An example COC form is attached (Attachment 4).

A.6.2.3 Field Instrument Calibration & Documentation

As discussed in Section A.5, navigational positioning will be acquired using DGPS instrumentation. Field measurements will include station position information.

Navigation instrumentation will be checked prior to the daily each day that CLDS reference site waters and sediments are sampled, and checked at the end of each sampling day, as specified on **Table A-6**. Calibration will follow the procedures detailed in SOP ES-G-02 (Appendix A).

Records of navigational accuracy and checking results will be recorded at the time of calibration or checking in the bound field logbook.

A.6.2.4 Documentation Procedures/ Data Management and Retention

Entries in field logbooks and on standardized forms will be reviewed for outliers and omissions prior to leaving the sampling site. Navigational data will be collected using DGPS integrated with computer-based navigational software. Actual survey positions will be documented at the time of sample collection on the electronic navigation charts and downloaded as survey records.

Any potential deviation from the work plan must be discussed with the Task Order Manager and NAE TM and corrective actions documented as discussed in Section A.9 and in ES-G-01 (Appendix A). If uncertainties arise, then the Field Services Task Leader may suspend activities until clarification is obtained from the task leadership (AECOM DPM, NAE TM).

Field station positions, collection dates/times, field analytical data and field observations will be included in field sampling documentation and will be appended to laboratory-submitted EDDs. Sample collection times will begin the COC record, based on unique sample IDs for discrete and composite samples, and all laboratory data will be maintained. Field and laboratory documentation will provide the source data for project progress, draft and final reports. Water chemistry and toxicity data will be provided in EDD format matching NAE's preferred format among the RIM specified formats. EDDs will be checked using the most current EDD Checker available on the RIM website. EDDs that pass the Checker without error will be submitted, along with the Checker report.

All field/ project records will be maintained in the electronic project files for a minimum of 5 years. Archived project files will include all field records as specialized log forms and measurement data, station positions, logbook photocopies, calibration records, EDDs, corrective action reports, and audit reports. The field report, final maps, progress reports, laboratory reports, and the draft and final Task Order reports will also be placed on the project website, as discussed in the QAPP Section of this Work Plan (Section B.13 Reports).

A.7 Sample Packaging and Shipping

All sample shipments will be accompanied by the COC record identifying the contents. The original record and one copy will accompany the shipment, and one copy will be retained by the sampler and placed in the project files.

Bulk samples will be transported via refrigerated truck/van; discrete samples may be properly packaged on ice at 4°C for shipment and dispatched to the laboratory for analysis according to AECOM SOP ES-G-05 (Appendix A). A separate signed COC will be enclosed in and secured to the inside top of each sample box or cooler.

All project samples will be transferred by project couriers; common carriers are not anticipated. If common carriers become necessary for discrete sample shipments, then samples will be placed in plastic coolers for storage and transfer according to procedures detailed in AECOM SOP ES-G-05. In these cases, custody seals will be attached to the front and back opposite corners of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations and the waybill will be retained in the project file.

A.8 Field Assessment/ Inspection

Sampling and subcontractor equipment will be checked by the Field Services Task Leader or designee during mobilization, initially before use, and at the end of each day. Furthermore, a field audit may be scheduled at the discretion of the Task Order Manager to verify the inspection process and to review methods and documentation from collection through final packaging and shipment.

Preliminary results of the audit will be reviewed with the Task Order Manager to ensure that deficiencies adversely affecting data quality are immediately corrected.

For this task, critical supplies for field activities will be tracked by the Field Services Task Leader as outlined in Table A-8.

Table A-8 Field Supplies, Equipment and Inspection Requirements

Critical Supplies and Consumables	Inspection Requirements and Acceptance Criteria
Sample Containers	Visually inspected upon receipt for cracks/ breakage/ cleanliness. Must be accompanied by certificate of analysis.
Field Equipment & Instrumentation	Functional checks to ensure proper operation and testing (echo sounder, DGPS)
Sampling Equipment	Visually inspected for obvious defects, damage, and contamination

Supplies and consumables not meeting acceptance criteria will initiate the appropriate corrective action as detailed in ES-G-01 (Appendix A). Corrective measures may include repair or replacement of measurement equipment, and/or notification of vendor and subsequent replacement of defective or inappropriate materials. All actions will be documented in the project files.

Field equipment testing activities are listed in **Table A-6** along with non-conformance corrective actions. The laboratory system of inspection and acceptance of supplies and consumable is documented in each project laboratory QA manual.

Field data will be reviewed daily by the Field Services Task Leader to ensure that the records are complete, accurate, and legible and to verify that the sampling procedures are in accordance with the protocols specified in the FSP and QAPP.

A.9 Nonconformance/Corrective Actions

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or poor performance that can affect data quality. Corrective action proposed and implemented should be documented in QA reports to management. Corrective action should only be implemented after approval by the Task Order Manager or designee.

Field Corrective Action

Corrective action in the field may be needed when the sample network is changed (i.e., more/ less samples, sampling locations other than those specified in the work plan, etc.), or when sampling procedures and/ or field analytical procedures require modification, etc., due to unexpected conditions. The field team may identify the need for corrective action. The DPM will notify the NAE Technical Manager who will approve the corrective measure. The Field Services Task Leader will ensure that the corrective measure is implemented by the field team.

Corrective actions will be implemented and documented in the field records (SOP ES-G-01 in Appendix A). Documentation will include:

- A description of the circumstances that initiated the corrective action;
- The action taken in response;
- The final resolution; and
- Any necessary approvals.

No staff member will initiate corrective action without prior communication of findings through the proper channels. If uncertainties arise in the field, the Chief Scientist may suspend field activities until clarification is obtained from the NAE TM.

Quality Assurance Project Plan

Sampling and Testing – New Haven Harbor Navigation Improvement Dredging Project, New Haven, Connecticut

B.0 Quality Assurance Project Plan (QAPP)

B.1 Project Laboratory Organization and Responsibilities

Two laboratories will support the environmental testing task: Alpha Analytical and ESI. The laboratory organization and work breakdown is depicted in **Figure A-1** and **Table B-1**.

Table B-1 Laboratory Roles and Responsibilities

Task	Responsibility	Management	Contact
Sample processing/composite formation, elutriate and SPP preparation, elutriate chemistry, and bioassays			
Task 6 • Elutriate Preparation	Kirk Cram, ESI Laboratory Director	Technical Advisor: Ken Simon Laboratory Director: Kirk Cram QA Officer: Catie Sasso Sample Custodian: James Provencher	EnviroSystems Inc., 1 Lafayette Rd, Hampton, NH 03842 (603) 926-3345
Task 7 • SPP Preparation and Bioassays	Kirk Cram, ESI Laboratory Director		
Task 7.1 • SPP with Ammonia Reduction (Optional)	Kirk Cram, ESI Laboratory Director		
Task 8 • 10-Day Whole Sediment Acute Toxicity Bioassays	Kirk Cram, ESI Laboratory Director		
Task 9 • 28-Day Bioaccumulation Bioassay	Kirk Cram, ESI Laboratory Director		
Task 10 • Tissue Statistical Analysis	Kirk Cram, ESI Laboratory Director		
Task 5 • Sediment Chemistry	Liz Porta, Alpha Laboratory Project Manager	Laboratory Manager: Christopher Ouellette	Alpha Analytical 320 Forbes Boulevard Mansfield, MA 02048 508 822-9300
Task 6 • Elutriate Chemistry	Liz Porta, Alpha Laboratory Project Manager	QA Officer: James Todaro	
Task 10 • Tissue Chemistry	Liz Porta, Alpha Laboratory Project Manager	Sample Custodian: Kim Bailey	

The ESI Technical Advisor is Mr. Ken Simon and the ESI Laboratory Director will be Mr. Kirk Cram. Mr. Cram will serve as the point of contact at ESI and will be responsible for technical, financial, and scheduling matters related to sample processing, chemical elutriate preparation, and bioassay testing tasks. Ms. Christine Archer, AECOM's Biology/Bioassay Laboratory Coordinator, will be the point of contact for the biology laboratory task leads and safety and quality managers.

Liz Porta will serve as the point of contact at Alpha for sediment and elutriate chemistry analysis and the tissue chemistry task. Ms. Edith Hutchinson, AECOM's Chemistry Coordinator, will also interface with the analytical laboratory task leads and safety and quality managers.

The **Laboratory Manager** is ultimately responsible for the data produced by the laboratory. Specific responsibilities include:

- Implementing and adhering to the laboratory QA manual and all corporate policies and procedures within the laboratory,
- Approving the SOPs,
- Maintaining adequate staffing documented on organization charts, and
- Implementing internal/external audit findings corrective actions.

Laboratory QA Coordinator

The Laboratory QA Coordinator reports to the Laboratory Manager. Specific responsibilities include:

- Approving SOPs;
- Assessing and maintaining the laboratory QA manual implementation within the facility operations;
- Recommending resolutions for ongoing or recurrent non-conformances within the laboratory;
- Performing QA assessments; and
- Reviewing and approving corrective action plans for non-conformances, tracking trends of non-conformances to detect systematic problems, and initiating additional corrective actions as needed.

The Laboratory Project Manager is the primary point of contact between the laboratory and the appropriate AECOM Laboratory and Chemistry Coordinator. Specific responsibilities of the Laboratory Project Manager include:

- Monitoring analytical and QA project requirements for a specified project,
- Acting as a liaison between the client and the laboratory staff,
- Reviewing project data packages for completeness and compliance to client needs, and
- Monitoring, reviewing, and evaluating the progress and performance of projects.

B.2 Data Assessment and Responsibilities

Organization of the data assessment tasks are detailed in **Table B-2**. Chemical data will be verified by the Alpha Analytical QA department to check that the laboratory tasks followed the specified methods and conform to the QAPP including measurement quality objectives (MQOs) and reporting specifications. Laboratory reports and data/EDD submittals will also be validated to check for completeness, evaluate quality control sample results and apply validation qualifiers as needed based on MQO non-compliance (e.g., blank contamination, etc.).

Similarly, the biological data will be verified by the ESI QA department to check that the laboratory tasks followed the specified methods, and conform to the QAPP specifications, including ancillary bioassay test water quality data collection.

B.3 Data Quality Objectives

The data quality objectives (DQOs) for this task have been established by EPA and USACE as documented in the RIM document (EPA/USACE, 2004). The DQO process, that is –problem statement, goal

identification and study questions, new data/analysis requirements, study boundaries, analytical approach with corresponding performance/acceptance criteria - have been incorporated into this Work Plan.

Table B-2 Data Assessments Organization and Responsibilities

Task	Data Verification Responsibility	Data Validation Responsibility
Task 5 <ul style="list-style-type: none"> Sediment Chemistry 	James Todaro, Alpha QA Officer 320 Forbes Boulevard Mansfield, MA 02048 508-822-9300	Sharon McKechnie, AECOM 250 Apollo Drive Chelmsford, MA 01824 978-905-2317
Task 6 <ul style="list-style-type: none"> Elutriate Chemistry Testing 		
Task 7 <ul style="list-style-type: none"> Standard SPP sample preparation SPP acute toxicity bioassays 	Catie Sasso, EnviroSystems Inc., 1 Lafayette Rd, Hampton, NH 03842 603-926-3345	Christine Archer, AECOM 1155 Elm Street Suite 401 Manchester, NH 03101 603-622-1556
Task 7.1 <ul style="list-style-type: none"> Suspended Phase Acute Toxicity Testing With Ammonia Reduction 		
Task 8 <ul style="list-style-type: none"> 10-day whole sediment acute toxicity bioassays 		
Task 9 <ul style="list-style-type: none"> 28-day bioaccumulation bioassay 		
Task 10 <ul style="list-style-type: none"> Tissue analysis 	James Todaro, Alpha QA Officer 320 Forbes Boulevard Mansfield, MA 02048 508-822-9300	Sharon McKechnie, AECOM 250 Apollo Drive Chelmsford, MA 01824 978-905-2317

B.3.1 Data Use Background

The assessment of dredged material typically follows a tiered testing approach. If data collected in earlier tests are insufficient to provide a basis for an environmental conclusion, then additional testing (higher level tiers) is undertaken to collect additional data. For example, if grain size data identified that the accumulated sediment to be dredged was only coarse-grained (i.e. sandy) material, then the exclusionary criteria admitting placement in the marine environment unconfined without further testing may be met. Conversely, fine-grained sediments require added testing before an impact assessment can be completed and a decision made with respect to the final dredged material placement.

Based on NAE decision-making, including prior analytical results, chemical and biological (bioassay) data will be generated concurrently during the performance of this Task Order to evaluate potential AWQC and LPC exceedances (Elutriate & SPP bioassays) and potential toxicity to sediment-associated organisms (10-day whole sediment acute toxicity bioassay with an amphipod and shrimp).

Overall, the data will be used to evaluate potential environmental impacts associated with the proposed dredging project in the New Haven Harbor proposed navigation site, but each data type will be addressed separately in the following sections.

B.3.2 Measurement Quality Objectives

MQOs for sensitivity are well established and published in the RIM document for this task. Required methods and corresponding target reporting limits are provided in the RIM document, summarized in this section, and detailed on **Table B-3** (sediment chemistry), **Table B-4** (aqueous chemistry) and **Table B-5** (tissue chemistry).

Table B-3 Sediment Methods, Reporting Limits, and Project-Required Detection Limits

Parameter	Method Reference	Method Number	Lab MRL	Project Required RL	RL Units
Metals					
Arsenic	SW-846	6020B	0.05	0.4	ppm
Cadmium	SW-846	6020B	0.02	0.07	ppm
Chromium	SW-846	6020B	0.2	0.5	ppm
Copper	SW-846	6020B	0.2	0.5	ppm
Lead	SW-846	6020B	0.06	0.5	ppm
Mercury	SW-846	7474	0.0125	0.02	ppm
Nickel	SW-846	6020B	0.1	0.5	ppm
Zinc	SW-846	6020B	1	1	ppm
PCBs					
Selected Congener analysis	SW-846	8270D-SIM(m)/NOA A)	0.0008	0.001	ppm
Pesticides					
Aldrin	SW-846	8081B	0.0005	0.001	ppm
Chlordane (cis- and trans-)	SW-846	8081B	0.0005	0.001	ppm
4,4' – DDT	SW-846	8081B	0.0005	0.001	ppm
4,4' – DDD	SW-846	8081B	0.0005	0.001	ppm
4,4' – DDE	SW-846	8081B	0.0005	0.001	ppm
Dieldrin	SW-846	8081B	0.0005	0.001	ppm
Endosulfan & derivatives (I, II)	SW-846	8081B	0.0005	0.001	ppm
Endrin	SW-846	8081B	0.0005	0.001	ppm
Heptachlor & derivative (epoxide)	SW-846	8081B	0.001	0.001	ppm
Hexachlorobenzene	SW-846	8081B	0.001	0.001	ppm
Hexachlorocyclohexane (lindane)	SW-846	8081B	0.0005	0.001	ppm
Methoxychlor	SW-846	8081B	0.002	0.001	ppm
Nonachlor (cis- and trans-)	SW-846	8081B	0.0005	0.001	ppm
Oxychlordane	SW-846	8081B	0.001	0.001	ppm
Toxaphene	SW-846	8081B	0.025	0.025	ppm
PAHs					
Acenaphthene	SW-846	8270D-SIM	0.008	0.01	ppm
Acenaphthylene	SW-846	8270D-SIM	0.008	0.01	ppm
Anthracene	SW-846	8270D-SIM	0.008	0.01	ppm
Benzo(a)anthracene	SW-846	8270D-SIM	0.008	0.01	ppm

Table B-3 Sediment Methods, Reporting Limits, and Project-Required Detection Limits

Parameter	Method Reference	Method Number	Lab MRL	Project Required RL	RL Units
Benzo(a)pyrene	SW-846	8270D-SIM	0.008	0.01	ppm
Benzo(b)fluoranthene	SW-846	8270D-SIM	0.008	0.01	ppm
Benzo(k)fluoranthene	SW-846	8270D-SIM	0.008	0.01	ppm
Benzo(g,h,i)perylene	SW-846	8270D-SIM	0.008	0.01	ppm
Dibenz(a,h)anthracene	SW-846	8270D-SIM	0.008	0.01	ppm
Chrysene	SW-846	8270D-SIM	0.008	0.01	ppm
Fluoranthene	SW-846	8270D-SIM	0.008	0.01	ppm
Fluorene	SW-846	8270D-SIM	0.008	0.01	ppm
Indeno(1,2,3-cd)pyrene	SW-846	8270D-SIM	0.008	0.01	ppm
Naphthalene	SW-846	8270D-SIM	0.008	0.01	ppm
Phenanthrene	SW-846	8270D-SIM	0.008	0.01	ppm
Pyrene	SW-846	8270D-SIM	0.008	0.01	ppm
Total Organic Carbon					
TOC	SW-846	9060A	0.01	0.1	%

Table B-4 Aqueous Methods, Reporting Limits, and Project-Required Detection Limits (Surface Water, Elutriates, and Blank Samples)

Parameter	Method Reference	Method Number	Lab MRL	Project Required RL	RL Units
Metals¹					
Arsenic	SW-846	6020B	1	1	ppb
Cadmium	SW-846	6020B	0.1	1	ppb
Chromium	SW-846	6020B	0.5	1	ppb
Hexavalent chromium	SW-846	3500Cr-B	3	1	ppb
Copper	SW-846	6020B	0.5	0.6	ppb
Lead	SW-846	6020B	0.5	1	ppb
Mercury	SW-846	7474	0.05	0.4	ppb
Nickel	SW-846	6020B	1	1	ppb
Selenium	SW-846	6020B	0.56	1	ppb
Silver	SW-846	6020B	0.125	0.5	ppb
Zinc	SW-846	6020B	5	1	ppb
Semi-volatile compounds					
Pentachlorophenol ²	SW-846	8270D	2	2.60	ppb
Pesticides					
Aldrin	SW-846	8081B	0.001	0.26	ppb
Chlordane (alpha/gamma/oxy)	SW-846	8081B	0.0005	0.02	ppb
Chloropyrifos	SW-846	8081B	0.001	0.002	ppb
4,4'-DDT	SW-846	8081B	0.0005	0.03	ppb

Table B-4 Aqueous Methods, Reporting Limits, and Project-Required Detection Limits (Surface Water, Elutriates, and Blank Samples)

Parameter	Method Reference	Method Number	Lab MRL	Project Required RL	RL Units
Dieldrin	SW-846	8081B	0.0005	0.14	ppb
Endosulfan and derivatives (I, II)	SW-846	8081B	0.0005	0.007	ppb
Endrin	SW-846	8081B	0.0005	0.007	ppb
Heptachlor & derivative (epoxide)	SW-846	8081B	0.001	0.01	ppb
Hexachlorocyclohexane (lindane)	SW-846	8081B	0.0005	0.26	ppb
Toxaphene	SW-846	8081B	0.025	0.04	ppb
PCBs					
Selected Congener analysis	SW-846	8270D-SIM(m)/NOA A	0.001	0.006	ppb

¹ Metals samples will be extracted from seawater matrix and preconcentrated before analysis.

² Pentachlorophenol will not be analyzed in the grab sampler equipment blank.

Table B-5 Tissue Methods, Reporting Limits, and Project-Required Detection Limits

Parameter	Method Reference	Method Number	Laboratory RL	Project Required RL	RL Units
Percent Moisture	SM 2540	SM 2540	0.1	0.1	%
Total lipids	NOAA 130, 1998	NOAA Tech Memo NOS ORCA 130, 1998	0.1	0.1	%
PCBs (wet wt.)					
PCB Congeners	SW-846	8270D-SIM(m)/NOA A)	0.8	0.5	ppb
Metals (wet wt.)					
Arsenic	SW-846	6020B	0.1	0.5	ppm
Cadmium	SW-846	6020B	0.04	0.1	ppm
Chromium	SW-846	6020B	0.4	1.0	ppm
Copper	SW-846	6020B	0.1	1.0	ppm
Lead	SW-846	6020B	0.04	1.0	ppm
Mercury	SW-846	7474	0.0125	0.02	ppm
Nickel	SW-846	6020B	0.1	1.0	ppm
Zinc	SW-846	6020B	1.0	1.0	ppm
PAHs (wet wt.)					
Acenaphthene	SW-846	8270D-SIM	0.008	0.02	ppm
Acenaphthylene	SW-846	8270D-SIM	0.008	0.02	ppm
Anthracene	SW-846	8270D-SIM	0.008	0.02	ppm
Benzo(a)anthracene	SW-846	8270D-SIM	0.008	0.02	ppm
Benzo(a)pyrene	SW-846	8270D-SIM	0.008	0.02	ppm

Table B-5 Tissue Methods, Reporting Limits, and Project-Required Detection Limits

Parameter	Method Reference	Method Number	Laboratory RL	Project Required RL	RL Units
Benzo(b)fluoranthene	SW-846	8270D-SIM	0.008	0.02	ppm
Benzo(k)fluoranthene	SW-846	8270D-SIM	0.008	0.02	ppm
Benzo(g,h,i)perylene	SW-846	8270D-SIM	0.008	0.02	ppm
Dibenz(a,h)anthracene	SW-846	8270D-SIM	0.008	0.02	ppm
Chrysene	SW-846	8270D-SIM	0.008	0.02	ppm
Fluoranthene	SW-846	8270D-SIM	0.008	0.02	ppm
Fluorene	SW-846	8270D-SIM	0.008	0.02	ppm
Indeno(1,2,3-cd)pyrene	SW-846	8270D-SIM	0.008	0.02	ppm
Naphthalene	SW-846	8270D-SIM	0.008	0.02	ppm
Phenanthrene	SW-846	8270D-SIM	0.008	0.02	ppm
Pyrene	SW-846	8270D-SIM	0.008	0.02	ppm
Pesticides (wet wt.)					
Aldrin	SW-846	8081B	0.0004	0.001	ppm
Chlordane – Alpha	SW-846	8081B	0.0004	0.001	ppm
Chlordane – gamma	SW-846	8081B	0.0004	0.001	ppm
Chlordane – oxy	SW-846	8081B	0.0008	0.001	ppm
4,4' – DDT	SW-846	8081B	0.0004	0.001	ppm
4,4' – DDD	SW-846	8081B	0.0004	0.001	ppm
4,4' – DDE	SW-846	8081B	0.0004	0.001	ppm
Dieldrin	SW-846	8081B	0.0004	0.001	ppm
Endosulfan & derivatives (I, II)	SW-846	8081B	0.0004	0.001	ppm
Endrin	SW-846	8081B	0.0004	0.001	ppm
Cis-Nonachlor	SW-846	8081B	0.0004	0.001	ppm
Heptachlor & derivative (epoxide)	SW-846	8081B	0.0008	0.001	ppm
Trans-Nonachlor	SW-846	8081B	0.0004	0.001	ppm
Hexachlorocyclohexane (lindane)	SW-846	8081B	0.0004	0.001	ppm
Methoxychlor	SW-846	8081B	0.004	0.001	ppm
Toxaphene	SW-846	8081B	0.020	0.05	ppm
Hexachlorobenzene	SW-846	8081B	0.0008	0.001	ppm
¹ RL – Reporting limit. Listed laboratory RLs correspond to clam and worm species.					

For this task, systematic checks have been included to ensure data quality. MQOs corresponding to the QC samples are detailed in **Table B-6** (Chemistry) and **Table B-7** (Bioassays) to ensure that the Data Quality Indicators (DQIs) support the task data usability quality requirements. Quantitative laboratory DQIs for accuracy are supported through the analysis of QC samples as method blanks, matrix spikes, standard reference materials, and in the case of bioassays, through the use of reference toxicants and the monitoring of controls (control survival).

DQIs for precision are supported with the analysis of QC sample spike and/or laboratory duplicates. Field blanks and in some cases field duplicates can also provide important indications of data quality and field blanks have been included in this task (refer to FSP). Completeness of targeted field and laboratory scopes is another important indicator of overall usability/quality.

Qualitative DQIs addressing representativeness and comparability will be assured to some degree through the high number of stations to be sampled, and the subsequent formation of composite samples. The use of RIM specified methods will also assure comparability of the dataset to historical data sets generated for similar purposes.

The MQOs established for the quantitative DQIs have been defined below for this task.

Precision

Precision is a measure of the degree to which two or more measurements are in agreement. Laboratory precision will be assessed through the calculation of Relative Percent Difference (RPD) for laboratory duplicate samples, either as matrix spike/ matrix spike duplicates (MS/MSDs) or as laboratory duplicates. Laboratory precision control limits are provided in **Table B-6**. Specific formulas/equations supporting these and other DQIs are provided in Section B.8 *Data Reduction/ Calculation of Data Quality Indicators*.

Accuracy

Accuracy is the degree of agreement between the observed value and an accepted reference or true value. Field accuracy will be assessed through the use of equipment rinsate blanks and through the adherence to all sample handling, preservation, and holding time requirements. Laboratory accuracy will be assessed through the analysis of MS/MSDs, standard reference materials (SRMs), laboratory control samples (LCSs), and surrogate compounds, and the subsequent determination of percent recoveries (%Rs). Accuracy control limits are provided in **Table B-6**.

Table B-6 Measurement Quality Objectives for Chemical Analytical Measurements

QC Sample	Units	GS	TOC	Pentachlorophenol	Metals	PCBs	Pest	PAHs	Corrective Action
Method Blank	Conc	-	-	<RL	<RL	<RL	<RL	<RL	1
Surrogate Spikes	% Rec	-	-	30-150	-	30-150	30-150	30-150	2
Matrix Duplicate	% RPD	-	<30	-<30	-<30	<30	<30	-<30	3
Matrix Spike	% Rec	-	-	50-120	75-125	50-120	50-120	50-120	4
MSD	% RPD	-	-	30	-	30	30	30	5
LCS	% Rec	-	-	50-120	80-120	50-120	50-120	50-120	6
SRM	% Rec		w/i limits	-	w/i limits	w/i limits	w/i limits	w/i limits	7

^aQC samples analyzed at a frequency of one per batch of 20 or fewer samples, except surrogates are added to each sample.

Corrective Action Codes:

- 1 Flag results if <5x blank concentration, re-extract or reanalyze the entire batch.
- 2 Re-extract sample, re-analyze sample or document and narrate
- 3 Flag results
- 4 Flag results
- 5 Investigate, re-analyze or flag results
- 6 Re-extract/reanalyze entire batch if all analytes are outside limits; if selected analytes affected, investigate and provide narrative.
7. Flag results

Data Qualifiers:

- J: Analyte detected < laboratory achieved detection limit (i.e., ssRL for organics and RL for metals) but above MDL.
 E: Estimate, result > highest concentration level in the calibration.
 B: Analyte concentration is <5x the level found in the procedural blank (the qualifier is only applied to the affected field samples).
 U: Not detected above laboratory achieved reporting detection limit
 Q: QC value outside the accuracy or precision criteria goal.

Table B-7 Bioassay Measurement Quality Objectives

QC Parameter	Measure or Acceptance Criteria	Corrective Action
SPP Toxicity Testing	<i>Menidia beryllina</i> : ≥90% control survival <i>Americamysis bahia</i> : ≥90% control survival <i>Arbacia punctulata</i> : ≥70% control survival	Re-run Test
10-Day Whole Sediment Acute Testing	<i>Leptocheirus plumulosus</i> ² : control ≥90% mean survival in control <i>Americamysis bahia</i> : ≥90% mean survival in control	Re-run Test
Reference Toxicity Tests (10-day and SPP)	≥90% mean survival in control (and within control chart limits)	Repeat entire test series
Suspended Phase Acute Toxicity Testing With Ammonia Reduction	<i>Menidia beryllina</i> : ≥90% control survival <i>Americamysis bahia</i> : ≥90% control survival <i>Arbacia punctulata</i> : ≥70% control survival	Re-run Test
28-day Bioaccumulation Assay	Sufficient <i>Macoma nasuta</i> and <i>Nereis virens</i> tissue for detection of target analytes	Re-run Test

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. "Normal conditions" are defined as the conditions expected if the sampling plan was implemented as planned.

- Field completeness is a measure of the amount of valid samples obtained during all sampling for the project. The field completeness objective is greater than 95%.
- Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The laboratory completeness objective is greater than 95%.

All analytical data that do not meet the listed MQOs will be submitted to the AECOM Laboratory and Chemistry Coordinators for review and assessment of the potential impact of the results. Affected samples may be reanalyzed at the discretion of the AECOM Task Order Manager. Data accepted outside these criteria (**Table B-5** and **Table B-6**) will be flagged with the appropriate data qualifier, and the rationale for accepting results will be thoroughly documented.

B.4 Sample Receipt, Handling, Custody, and Holding Time Requirements**B.4.1 Sample Receipt Condition Verification/Documentation**

Upon sample receipt at the laboratories, the condition of samples and associated packaging will be evaluated and documented on a sample receipt form (Attachments 6 and 7). As noted on the form, temperature, container condition, unique or unusual sample observations, labeling discrepancies, preservation status, COC completeness, etc. will be documented and a copy sent to the AECOM Laboratory Coordinator without delay.

² The PWS lists *Ampelisca abdita* as the test species for this test. However, due to availability, *Leptocheirus plumulosus* may be substituted. This potential change was documented in the proposal assumptions.

When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the COC form (Attachment 4). This record documents the transfer of custody of samples from the sampler to another person, to the permanent laboratory, or to/from a secure storage location.

B.4.2 Corrective Action for Incoming Samples

Corrective actions may in some cases be taken on incoming samples that do not meet storage requirements. All actions are to be discussed with the Task Order Manager, and may include re-containerizing samples when containers are cracked, etc.

Corrective actions will be documented in the project file. Documentation will include:

- A description of the circumstances that initiated the corrective action;
- The action taken in response;
- The final resolution; and
- Any necessary approvals.

No person will initiate corrective action without prior communication of findings through the proper channels.

B.5 Sample Preparation for Chemical & Biological Tests

Station homogenates will be prepared initially in the field by mixing the sediment within each bucket with large pre-cleaned stainless steel spoons as additional sediment is added.

Stations will be re-homogenized at the bioassay laboratory (ESI) before sample pooling commences by mixing the full volume collected from each station in a large 40-L high density polyethylene (HDPE) plastic bin. These same bins will be used to mix the station composites, one bin per composite for storage between subsampling for the Elutriate/SPP samples and the 10-day bioassay.

Composites will be prepared by mixing **equal volumes** from each station to form the final composite sample (see **Table A-1** for compositing scheme). Field sample container and storage requirements are detailed on **Table A-7**.

Tools used in sample transfer and mixing will be either stainless steel or Teflon pre-cleaned using the Level III decontamination procedure detailed in SOP ES-G-03 (Appendix A). Composite labeling will be as specified in **Table A-1** and **Table A-2**. Materials will be retained (refrigerated) until NAE accepts/approves the final project report.

B.6 Analytical Procedures– Chemical Parameters (Task 5)

B.6.1 Bulk Sediment Chemistry

Bulk sediment samples will be analyzed by sediment chemical methods (Task 5, Alpha). **Table B-3** details the methods and Reporting Limits (RLs) established as DQOs (equivalent to RIM requirements) to meet project objectives.

Total Organic Carbon (TOC) will be analyzed as detailed in Alpha SOP 17452 Total Organic Carbon and Soot in Soil, Sediment (Revision 1, July 2015). All samples will be analyzed in duplicate. Results will be reported on a dry-weight basis.

Trace Organic Parameters as PAHs, PCB Congeners and pesticides will be analyzed following Alpha SOPs 2157, Analysis of Polynuclear Aromatic Hydrocarbons and PCB Congeners by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (Revision 14, September 2017) and 2158, Determination of Organochlorine Pesticides By Gas Chromatography/Electron Capture Detection (GC/ECD) (Revision 14, May 2018). Samples are extracted three times using appropriate solvent. Extracts

are combined, dried over sodium sulfate, and evaporatively concentrated. Concentrated extracts may require cleanup before analysis. Cleanup procedures may include copper, silica gel, florisil, sulfuric acid or other appropriate cleanup techniques.

Target compound identification will be based on dual- column analysis for GC analyses or reference mass spectral identification for GC-MS analyses.

Quantitation will be based on response factors determined from an initial 5 point calibration using internal standards for both GC and GC-MS analyses.

All results will be reported in microgram per kilogram ($\mu\text{g}/\text{kg}$) dry weight.

Metals (arsenic, cadmium, chromium, copper, lead, nickel, and zinc) will be analyzed following procedures in Alpha SOP 2137, Inductively Coupled Plasma-Mass Spectrometry (Revision 15, January 2018). Sample preparation will be conducted according to the SOP An aliquot of digestate will be nebulized into a spray chamber where a stream of argon carries the sample aerosol through a quartz torch and injects it into the radio frequency inductively coupled plasma. The ions produced in the plasma are introduced to the mass spectrometer for quantification against a single point initial calibration. All results are reported in milligrams per kilogram (mg/kg) dry weight.

Mercury will be analyzed following procedures in Alpha SOP2143, Mercury Determination in Tissue and Soil/Sediment Samples by Cold Vapor Atomic Fluorescence Technique (CVAf) (Revision 8, July 2015) Sediment samples (approximately 1 g) will be digested by hot plate in an aqua regia acid solution. An aliquot of the digest will then be prepared with HCL/BrCl and hydroxylamine hydrochloride solution. Mercury in the digested sample is reduced to elemental mercury, aerated from solution and introduced into the spectrophotometer. The emission is measured and compared to a multi-level initial calibration for quantification. All results will be reported in mg/kg dry weight.

B.6.2 Elutriate/ SPP Preparation & Aqueous Analytical Procedures (Tasks 6 and 7)

The preparation of elutriate and SPP samples will utilize the sediment composites prepared as detailed above. Elutriate and other (i.e., equipment blanks and CLDS Reference Site water) aqueous samples will be analyzed for trace metals, PAHs (equipment blank only), PCBs/pesticides and pentachlorophenol (not in CLDS water equipment blanks). The samples will be prepared in glass containers. The elutriate/SPP preparation must commence no later than 14 days after seawater collection. Elutriate and SPP samples will be prepared concurrently and used within 24 hours of preparation.

The elutriate samples are prepared by placing one volume of test sediment and four volumes of dredging site water (i.e. harbor water) from the appropriate site in an eight-gallon glass container and mixing vigorously with a magnetic stir bar. Additionally, the sediment/water mixture will be hand stirred at approximately 10 minute intervals during the mixing period. At the end of the 30-minute period, the sediment/water mixture will be allowed to settle for one hour and the supernatant (elutriate) siphoned off for testing. Sufficient sediment and seawater volumes are used to prepare samples for chemical analysis of the elutriate and creation of SPP bioassay sample dilutions. If required, the SPP portion may be centrifuged (only enough to clear the water so organisms can be seen) to facilitate biological observations.

The elutriate samples will be prepared in **triplicate** for the analyses of PCBs/pesticides, pentachlorophenol, and trace metals. Elutriate samples will be centrifuged at ESI, split for metals and organic analysis, and then containerized. Elutriate blanks are defined for this project as the site water (used to prepare elutriates) that are run through the entire elutriate preparation process for background correction purposes.

Table B-4 details the list of target elutriate analytes, corresponding analytical method references, and target detection limits for the aqueous project samples.

Trace Organic Parameter elutriate and elutriate blank samples will be centrifuged at Alpha and analyzed at Alpha. Rinsate blank samples will be transferred to Alpha directly from the field. PAH (sediment equipment

blank), pentachlorophenol, PCB Congeners and pesticides will be analyzed following the Alpha SOPs 2155 (Revision 20, 11/29/17) Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), 2157 (Revision 14, 9/28/17) Analysis of Polynuclear Aromatic Hydrocarbons and PCB Congeners by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring and 2158 (Revision 14, 5/23/18) Determination of Organochlorine Pesticides by Gas Chromatography/Electron Capture Detection (GC/ECD). Water samples will be extracted according to Alpha SOP (Revision 14, 1/15/16) Extraction of Water Samples by Separatory Funnel.

Samples are extracted three times using appropriate solvent. Extracts are combined, dried over sodium sulfate, and evaporatively concentrated. Concentrated extracts may require cleanup before analysis. Cleanup procedures may include copper, silica gel, florisil, sulfuric acid or other appropriate cleanup techniques.

Target compound identification will be based on dual-column analysis for GC analyses or reference mass spectral identification for GC/MS analyses.

Quantitation will be based on response factors determined from an initial 5 point calibration using external standards for GC analyses and internal standards for GC/MS analyses.

All results will be reported in microgram per liter ($\mu\text{g/L}$) units.

Metals elutriate and elutriate blank samples will be prepared by ESI and analyzed at Alpha Analytical. The reference site water samples will be transferred to ESI directly from the field. Elutriate and elutriate blank samples will be analyzed for ten metals: arsenic, cadmium, hexavalent chromium, copper, nickel, lead, silver, selenium, zinc, and mercury.

Mercury will be analyzed following procedures in Alpha SOP 2142 (Revision 8, 1/21/16), Mercury Determination in Aqueous Samples by Cold Vapor Atomic Fluorescence Technique (CVAF). Water samples will be digested in an acidic, oxidizing solution consisting of sulfuric acid, nitric acid, potassium permanganate and potassium persulfate and heated in a block digester at 90-95C for two hours to convert all forms of mercury to inorganic mercury. The CVAA technique is based on the absorption of radiation at 253.7-nm by mercury vapor. Mercury is reduced with stannous chloride to elemental mercury. The elemental mercury is aerated as mercury vapor from the digestate in a closed system where the vapor passes through a cell positioned in the light path of an atomic absorption spectrometer. The absorbance is measured as a function of mercury concentration based on the peak height measured. Arsenic, cadmium, copper, nickel, lead, selenium, silver, and zinc will be extracted from seawater according to Alpha SOP 2152 (Revision 3, 7/22/15) Seawater Extraction Procedure for Trace Metals and/or simply digested according to SOP 18716 (Revision 2, 7/27/16) Hot Block Digestion For Aqueous Samples; and analyzed according to Alpha SOP 2137 (Revision 15, 1/24/18) Inductively Coupled Plasma-Mass Spectrometry 6020.

Hexavalent chromium will be analyzed according to Alpha SOP 2204 (Revision 7, 3/28/16) Hexavalent Chromium.

All metals results will be reported in mg/L units.

B.6.3 Tissue Analytical Procedures (Task 10)

Although the 28-day bioaccumulation testing will be performed on all composite group sediment samples, chemical analyses will only be performed on tissue samples for those sediments that pass the 10-day whole sediment acute toxicity test. **Table B-5** lists the potential parameters that may be analyzed in the bioaccumulative tissue samples. If selected parameters are not detected in selected sediment composites, then those parameters may be omitted from tissue testing with NAE approval.

Trace organic tissue parameters as PAHs, PCB Congeners and Pesticides will be analyzed after preparation following Alpha SOPs 2157 (Revision 14, September 2017) Analysis of Polynuclear Aromatic

Hydrocarbons and PCB Congeners by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring and 2158, Determination of Organochlorine Pesticides By Gas Chromatography/Electron Capture Detection (GC/ECD) (Revision 14, May 2018). Samples are extracted three times using appropriate solvent. Extracts are combined, dried over sodium sulfate, and evaporatively concentrated. Concentrated extracts may require cleanup before analysis. Cleanup procedures may include copper, silica gel, florisil, sulfuric acid or other appropriate cleanup techniques.

Target compound identification will be based on dual- column analysis for GC analyses or reference mass spectral identification for GC-MS analyses.

Quantitation will be based on response factors determined from an initial 5 point calibration using internal standards for both GC and GC-MS analyses.

Quantitation will be based on response factors determined from an initial 5 point calibration using external standards for GC analyses and internal standards for GC-MS analyses.

All tissue results will be reported in nanograms per gram (ng/g) on a wet weight basis.

Lipid Content in tissue samples will be determined according to NOAA Tech Memo 130, 1998. An aliquot of tissue is weighed in a tared glass vial and the lipid content of the sample is extracted using a specific ratio of solvent to water. The sample is serially extracted three times. The organic layer is removed and dried over sodium sulfate. The extract is evaporated to dryness, leaving the lipid content. Amount of residue is determined gravimetrically.

The results will be reported in % wet tissue.

Metals tissue samples will be processed according to Alpha SOP 2137 (Revision 15, January 2018) Inductively Coupled Plasma-Mass Spectrometry.

For metals other than mercury, an aliquot of the digestate will be analyzed following procedures in Alpha SOP 2137. By this procedure, the digestion solution is nebulized into a spray chamber where a stream of argon carries the sample aerosol through a quartz torch and injects it into the radio frequency inductively coupled plasma. The ions produced in the plasma will be introduced to the mass spectrometer for quantification against a single point initial calibration.

Mercury will be analyzed following procedures in Alpha SOP 2143 (Revision 8, July 2015) Mercury Determination in Tissue and Soil/Sediment Samples by Cold Vapor Atomic Fluorescence Technique. An aliquot of the digest is prepared with HCL/BrCl and hydroxylamine hydrochloride solution. Mercury in the digested sample will be reduced to elemental mercury, aerated from solution and introduced into the fluorescence detector. The fluorescence will be measured and compared to a multi-level initial calibration for quantification.

All metals results will be reported in micrograms per gram ($\mu\text{g/g}$) on a wet weight basis.

B.6.4 Preventive Maintenance

Routine testing and preventive maintenance is performed by the laboratory as part of their QA program. Details on the type of checks, frequencies, and corrective actions associated with the project measurements are included in the accompanying laboratory QA manuals.

B.6.5 Calibration Procedures & Frequency

Specific laboratory method calibration procedures and frequency requirements are detailed in NAE QC summary tables, referenced in the RIM (EPA/ USACE, 2004) and included in Appendix B.

Calibration procedures for laboratory instruments will consist of initial calibrations, initial calibration verifications, and continuing calibration verification. The SOP for each analysis performed in the laboratory describes the calibration procedures, their frequency, acceptance criteria, and the conditions that will require recalibration. This information is summarized in the laboratory QA Manuals.

The laboratory maintains documentation for each instrument which includes the following information: instrument identification, serial number, date of calibration, analyst, calibration solutions, and the samples associated with these calibrations.

Inspection/ Acceptance of Supplies and Consumables

The laboratory system of inspection and acceptance of supplies and consumable is documented in the laboratory QA Manuals.

Supplies and consumables not meeting acceptance criteria will initiate the appropriate corrective action. Corrective measures may include repair or replacement of measurement equipment, and/or notification of vendor and subsequent replacement of defective or inappropriate materials. All actions will be documented in the project files.

B.6.6 Laboratory QC Procedures

Each batch of twenty or fewer sediment samples analyzed for organic contaminants (PCB/ pesticides and PAHs) and metals will be prepared with a routine set of QC samples, including one method blank, one laboratory control sample, one matrix spike, one matrix spike duplicate, one sample duplicate, and one sediment standard reference material sample. For total organic carbon analysis, one sediment standard reference material sample will be prepared with each batch of sediment samples.

Each batch of twenty aqueous samples analyzed for organic contaminants and metals will be prepared with a set of QC samples as specified in the RIM. For organic contaminant analysis, QC samples will include one method blank, one laboratory control sample, one matrix spike, and one matrix spike duplicate. For metals analyses, QC samples will include one method blank, one laboratory control sample, one matrix spike and one matrix spike duplicate.

Each batch of twenty or fewer tissue samples analyzed for organic contaminants (PCB/ pesticides and PAHs) and metals will be prepared with a routine set of QC samples, including one method blank, one laboratory control sample, one matrix spike, one matrix spike duplicate, one sample duplicate, and one tissue standard reference material sample. For lipid content analysis, one sample duplicate will be prepared with each batch of tissue samples.

B.6.7 Performance and System Audits

The sediment analytical program includes analysis of Standard Reference Materials (SRMs), which provide an excellent way to audit the performance of laboratory procedures for sample preparation and analysis. Field and/or laboratory system audits may be performed at the discretion of the NAE TM to ensure project personnel are performing project related tasks according to the project specific Work Plan and associated field and laboratory SOPs.

Field Audit

As detailed in Section A.9 of the FSP, the AECOM Field Services Task Leader will be responsible for ensuring that the approved procedures documented in the Work Plan (FSP and QAPP) are being followed. The Task Leader will review field sampling records, field measurement results, and field instrument operating and calibration records. The Field Services Task Leader will also be responsible for monitoring procedures for sample collection, handling, and packaging procedures, QA procedures, chain-of-custody, and sample documentation, etc.

If significant deficiencies are noted in procedures outlined in the QAPP, corrective action will be implemented as discussed in Section B.6.6.

Laboratory Audit

Laboratory audits are conducted periodically by AECOM as part of their analytical subcontractor monitoring program. A typical systems audit includes review of the following areas:

- QA organization and procedures,
- Personnel training and qualifications,
- Sample log-in procedures,
- Sample storage facilities,
- Analyst technique
- Adherence to laboratory SOPs and project Work Plan,
- Compliance with QA/QC objectives,
- Instrument calibration and maintenance,
- Data recording, reduction, review, and reporting, and
- Cleanliness and housekeeping.

Preliminary results of the audit are discussed with the Laboratory Manager, Laboratory Project Manager, and Laboratory QA Coordinator. A written report that summarizes audit findings and recommends corrective actions is prepared and submitted to the Laboratory Manager for response, and to the AECOM Project Manager.

Data Package Audits

Audits of analytical data packages will be conducted for 100% of the packages received as part of the data validation process (Section B.11). The review will include an evaluation of the package to ensure that (1) all required deliverables are provided, (2) the package contains the information necessary to reproduce the reported results, and (3) the QC acceptance criteria specified in the Work Plan were met. Any deficiencies will be communicated to the laboratory and documented in the project files.

Audit Samples

Audit samples will be incorporated into the program as discussed in the Laboratory QC Procedures section above. Results for the audit/SRM samples will be reviewed by the Chemistry / Laboratory Coordinator and compared to the acceptable limits provided by the vendor. Failure to meet the acceptance criteria will result in the review of the results and supporting data by the laboratory to identify the cause of the failure. Depending on the outcome of this review, subsequent corrective actions may include the following:

- Qualification/flagging of affected data,
- Discarding affected data and re-analysis, or
- Discarding affected data, re-sampling, and re-analysis.

B.6.8 Nonconformance & Corrective Actions

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter Work Plan specification nonconformance, unacceptable procedures, or out-of-limit QC performance that can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. All corrective action proposed and implemented will be documented as detailed in Section B.13 - Reports.

Corrective action should only be implemented after approval by the AECOM Task Order Manager, or his designee. Field related corrective action is discussed in Section A.10 of the FSP.

Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during, and after initial analyses. A number of conditions such as broken sample containers, multiple phases, low/high pH readings, and potentially high concentration samples may be identified during sample log-in or analysis. Following consultation with laboratory analysts and supervisory personnel, it may be necessary for the Laboratory QA Coordinator to approve the implementation of corrective action. If the nonconformance causes project objectives not to be achieved, the AECOM Task Order Manager will be notified.

These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the laboratory's corrective action files, and in the narrative data report sent from the laboratory to the AECOM Laboratory Coordinator and the AECOM Task Order Manager. If the corrective action does not rectify the situation, the laboratory will contact the AECOM Task Order Manager who, in concert with the AECOM Laboratory Coordinator and NAE's TM, will determine the action to be taken and inform the appropriate personnel.

Chemical Measurements

The need for corrective action may be identified during either data validation or data assessment. Potential types of corrective action may include resampling by the field team or reinjection/reanalysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field team and whether the data to be collected is necessary to meet the required QA objectives. If the AECOM Laboratory identifies a corrective action situation, the AECOM Task Order Manager will be responsible for informing the appropriate personnel.

B.6.9 Corrective Action Reports to Management

QA reports will be submitted to the AECOM Task Order Manager to ensure that any problems identified during the sampling and analysis programs are investigated and the proper corrective measures taken in response. The QA reports will include:

- All results of field and laboratory audits,
- Problems noted during data validation and assessment, and
- Significant QA/QC problems, recommended corrective actions, and the outcome of corrective actions.

QA reports will be prepared by the AECOM Project QA Officer and submitted on an as-needed basis.

B.7 Analytical Procedures – Bioassays (Tasks 7, 7.1 & 8)

All toxicity testing will be conducted following protocol guidance presented in NAE's RIM (EPA/USACE, 2004) and in the Inland Testing Manual (EPA/USACE, 1998).

B.7.1 SPP Bioassays (Task 7)

SPP toxicity tests will commence no later than 24 hours after the SPP is prepared. SPP from all six of the composites will be tested at 100%, 50%, 10%, and 0% concentrations, using the CLDS Reference Site water as the dilution water. In addition, a 1% concentration may be run. Three species, *M. beryllina*, *A. bahia*, and *A. punctulata*, will be exposed to the SPP dilution series, reference site water, as well as a clean seawater control (i.e., laboratory control). All SPP tests will be conducted static, with aeration provided if dissolved oxygen falls below 40% saturation (~4 milligrams per liter [mg/L] at 20°C and 30 parts-per-thousand salinity). The *M. beryllina* and *A. bahia* tests are 96-hour duration; the *A. punctulata* larval development test is 48-72-hour duration. A reference toxicant test of the same duration, using ammonia in clean seawater, will be performed with each SPP test species on a regular basis by the laboratory. Specific test conditions for the SPP tests are provided in **Table B-7**.

To account for the potential for ammonia toxicity to adversely impact the SPP results, total ammonia in the undiluted elutriate samples will be measured prior to test initiation and the un-ionized ammonia concentration will be calculated based on additional measurements of pH, temperature, and salinity. If the calculated un-ionized ammonia concentrations are greater than the applicable WQC (or approximately 0.23 mg/L un-ionized ammonia³), the NAE will be notified within 24 hours. NAE will then provide guidance on whether to implement project-specific procedures for the preparation of additional elutriate samples treated to reduce ammonia levels and conduct additional SPP toxicity testing (see optional Task 6.1 described in Section B.7.2).

If un-ionized ammonia concentrations in the undiluted elutriate samples exceed 0.1 mg/L, then total ammonia concentrations (and calculated un-ionized ammonia concentrations) will be measured in all elutriate dilutions at the start and end of each test. If complete mortality is observed prior to the full test duration, then total ammonia (and calculated un-ionized ammonia) will be measured when the test is ended.

B.7.2 SPP Bioassays with Ammonia Reduction (Task 7.1, Optional)

The test organisms used in SPP toxicity testing are sensitive to ammonia, and excessive ammonia concentrations may cause a toxic response in the toxicity tests that is not related to other chemical contaminants present in the elutriate. Therefore, if elevated ammonia levels are identified in the undiluted elutriate samples (as described in Section B.7.1), then an ammonia reduction protocol may be implemented (at the discretion of NAE) to generate a second elutriate and to repeat SPP testing (elutriate chemistry sampling will not be repeated) for one or more composites.

When ammonia concentrations are determined to be at potentially toxic levels (as described in Section B.7.1) and NAE has provided approval, an ammonia reduction procedure (referred to as the Ferretti Ammonia Reduction Procedure; Ferretti et al., 2001) will be run to reduce the levels of ammonia in test sediments to nontoxic levels before the sediments are used to prepare the elutriate samples for the SPP tests. A thin layer of the test sediment is placed in a plastic tray and clean seawater (4 times the sediment volume) is slowly added over the top of the sediment. The tray is aerated and renewed with clean seawater once daily, being careful not to disturb the sediment. Sediment porewater shall be monitored daily for ammonia and ESI will communicate daily with AECOM regarding the ammonia reduction progress. When the un-ionized ammonia in the porewater is less than 0.1 mg/L, aeration is stopped and the sediment is used to prepare the elutriate samples with site water to use in the SPP tests.

Total and un-ionized ammonia levels will be measured in all elutriate dilutions at the start and end of each test for the ammonia reduced elutriates. If complete mortality is observed prior to the full test duration, then total ammonia (and calculated un-ionized ammonia) will be measured when the test is ended. The ammonia monitoring records and all measurement made during the assays will be included in the SPP report.

The SPP tests conducted with elutriates prepared after the ammonia reduction procedure are conducted as described in Section B.7.1. Specific test conditions for the SPP tests are provided in **Table B-7**.

³ In accordance with 10/15/18 discussion between NAE (R. Loyd) and AECOM (K. van Naerssen).

Table B-8 Suspended Particulate Phase Testing Conditions

Parameter	<i>Americamysis bahia</i>	<i>Menidia beryllina</i>	<i>Arbacia punctulata</i>
Treatments (SPP prepared from sediment composites and harbor water)*	6 Sample Composites and 1 CLDS Reference Site water	6 Sample Composites and 1 CLDS Reference Site water	6 Sample Composites and 1 CLDS Reference Site water
Replicates	5	5	5
Test population	1-5 days old	7-10 day with 24 hours variation	2 hours after fertilization
Temperature	Mean of 20 ± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C
Dissolved Oxygen	40% Saturation	40% Saturation	NA
pH	NA	NA	NA
Salinity	25 – 30 ‰ ±10%	25 – 30 ‰ ±10%	30-32‰
Ammonia	NA	NA	NA
Feeding	Daily, <24 hour old <i>Artemia nauplii</i>	Daily, <24 hour old <i>Artemia nauplii</i>	None
Reference Toxicant	Ammonia	Ammonia	Ammonia

*Study design also includes laboratory control.

B.7.3 10-day Whole Sediment Bioassay (Task 8)

The 10-day whole sediment toxicity testing will commence no later than six weeks after the sample collection date.

Whole sediment acute toxicity testing will be performed using the marine invertebrates *Leptocheirus plumulosus* and *A. bahia*. *L. plumulosus* and *A. bahia* will be exposed to all six sample composites plus the CLDS Reference Site sediment. A laboratory control will also be run with each test. Tests with each species will be 10-day static renewal exposures with mortality as the endpoint. Depending on the concentrations of ammonia in bulk sediment and/or overlying water, the test chambers may require purging to reduce ammonia below toxic levels prior to the addition of test organisms.

The acceptable porewater ammonia concentrations for *L. plumulosus* at test initiation is 60 mg/L total ammonia and 0.8 mg/L for un-ionized ammonia (EPA, 1994, 2001). These levels are higher than the levels recommended for amphipods in the RIM (20 mg/L total and 0.4 mg/L un-ionized) but are acceptable levels for *L. plumulosus*. The acceptable overlying water ammonia concentration for *A. bahia* is 0.6 mg/L as un-ionized ammonia. The Ferretti Ammonia Reduction Procedure (Ferretti et al., 2001) described in Section B.7.2 will be used to purge ammonia from the sediments, if needed. Overlying and porewater ammonia will be monitored each day during the purging period. Once acceptable porewater ammonia concentrations are reached, the 10-day whole sediment bioassay can begin. It is anticipated that the ammonia purging procedures for the 10-day test whole sediment bioassay will be conducted concurrent with the Task 7.1 SPP assays, if the Task 7.1 option is executed. Sediments for the 10-day test whole sediment bioassay will be containerized and refrigerated at 4°C after they meet the acceptable porewater ammonia concentration for *L. plumulosus*. The ammonia reduced sediments will be added to test vessels and allowed to equilibrate with overlying water under test conditions for at least 24 hours prior to the addition of test organisms. Porewater and overlying ammonia will be measured at least 24 hours prior to the addition of test organisms to confirm that ammonia levels are at acceptable levels.

For both test species, organisms (20 per chamber) will be introduced to the test chambers once ammonia levels are within acceptable levels. Overlying water will be monitored on Days 0, 3, and 10 of the test, per the guidance in Appendix F of the Inland Testing Manual (Day 0, 10 monitoring) and NAE (intermediate Day 3 monitoring). Porewater ammonia will be monitored in the amphipod test on Day 0, 3 and 10 as well.

The static-renewal test conditions of one exchange per day should ensure that ammonia remains within acceptable range. However, if the Day 3 monitoring results show that ammonia was above the acceptable range, the static-renewal frequency will be increased to up to two exchanges per day. Other water quality parameters (temperature, pH, dissolved oxygen, and salinity) will be measured in all replicates at test initiation, in one replicate per day during the test, and again in all replicates at test termination.

Reference toxicant assays will be conducted by the laboratory on a regular basis for each test species. The bioassay tests will also include a 96-h, water-only, reference toxicant test using ammonia to assess the sensitivity of *L. plumulosus* and *A. bahia*. Specific test conditions for the whole sediment toxicity tests are provided in **Table B-8**.

Table B-9 10-day Whole Sediment Test Conditions

Parameter	<i>Leptocheirus plumulosus</i>	<i>Americamysis bahia</i>
Treatments*	6 Sample Composites and 1 CLDS Reference Site Control	6 Sample Composites and 1 CLDS Reference Site Control
Replicates	5	5
Test population	Sub-adult (3-5 mm)	1-5 days old
Temperature	Mean of 20± 1°C Maximum Deviation of 3°C	Mean of 20 ± 1°C Maximum Deviation of 3°C
Dissolved Oxygen	>40% Saturation	40% Saturation
pH	NA	NA
Salinity	20 – 30‰ ±10%	25 – 30‰ ±10%
Ammonia	Porewater un-ionized ammonia <0.8 mg/L	Overlying water un-ionized ammonia <0.6 mg/L
Feeding	None	Daily, <24 hour old <i>Artemia nauplii</i>
Reference Toxicant	Ammonia	Ammonia

*Study design also includes laboratory control.

B.7.4 28-day Bioaccumulation Bioassay (Task 8)

Project bioaccumulation tests will commence within six weeks of sample collection. Chemical analyses will only be performed on tissue samples for sediments that pass the 10-day whole sediment acute toxicity test. Bioaccumulation tests will be performed by ESI according to the NAE Regional Guidance (EPA/USACE 1998, 2004).

Macoma nasuta and *Nereis virens* will be exposed to the six sample composites, plus the CLDS Reference Site sediment, and native control sediments (i.e., negative laboratory control), for 28 days under flow-through conditions. *M. nasuta* and *N. virens* will be tested in separate 10-gallon aquaria, with five replicate aquaria per treatment. Twenty organisms will be introduced into each replicate aquaria⁴.

Water quality parameters (temperature, dissolved oxygen, pH, and salinity) will be measured in all replicates at test initiation, in at least one replicate per treatment daily, and in all replicates at test termination. Flow rates into individual aquaria are measured daily and adjusted as necessary from Days 0 through 27 of the bioaccumulation test. If necessary, aeration will be provided to all test chambers to maintain dissolved oxygen >40% saturation.

⁴ The PWS identified a minimum of 30 *M. nasuta* per replicate; however, the toxicity testing laboratory has indicated that sufficient test mass will be achieved with 20 organisms per replicate.

At the end of the 28-day testing period, *M. nasuta* and *N. virens* will depurate in clean seawater for 24 hours. Specific test conditions for the 28-day bioaccumulation test are provided in **Table B-9**.

Table B-10 28-Day Bioaccumulation Bioassay Test Conditions

Parameter	<i>Macoma nasuta</i>	<i>Nereis virens</i>
Treatments*	6 Sample Composites and 1 CLDS Reference Site Control	6 Sample Composites and 1 CLDS Reference Site Control
Replicates	5	5
Test population	Adult clam	Adult Polychaete; 3-15 grams
Temperature	Mean of 12 ±2°C Maximum Deviation of 3°C	Mean of 12 ± 2°C Maximum Deviation of 3°C
Dissolved Oxygen	>40% Saturation	>40% Saturation
pH	NA	NA
Salinity	25 – 30‰ ±10%	25 – 30‰ ±10%
Ammonia	NA	NA
Feeding	None	None
Reference Toxicant	NA	NA

*Study design also includes laboratory control.

B.7.5 Tissue Analysis (Task 10)

Following depuration, organism tissues will be homogenized, transferred into the appropriate chemistry jars for tissue chemistry analyses and stored frozen (<20°C) until analysis. Tissue sample container and storage requirements are detailed in **Table B-11** and Attachment 5.

Table B-4 Sample Container, Preservation, and Holding Time Requirements for Tissue Samples

Tissue Parameters	Mass (g)	Container	Preservation	Storage	Holding Time
Lipids	0	N/A – lipid content obtained from organic analysis			
Moisture	2-10	Glass	Freeze	-20°C	14 d (1yr if frozen)
Organic Chemistry (PAHs/PCBs/Pesticides)	40	Glass	Freeze	-20°C	14 d or 1yr if frozen (extract)/ 40 d (analyze) when thawed
Metals Chemistry	10	Glass	Freeze	-20°C	28 d (Hg), 180 d or 1yr if frozen (other metals) when thawed

B.7.6 Preventive Maintenance

Routine testing and preventive maintenance of instrumentation needed to carry out bioassay test chamber monitoring is performed by the laboratory as part of their QA program. Details on the type of checks, frequencies, and corrective actions associated with the project measurements are included in the accompanying laboratory QA manuals.

B.7.7 Calibration Procedures & Frequency

Calibration of bioassay monitoring instrumentation will be guided by the procedures detailed in the laboratory QA manual.

Ammonia and pH measurement probes will be calibrated immediately before (daily) use and at the finish of (daily) monitoring activities. Thermometers and temperature recording devices will be checked daily and are calibrated annually against a calibrated NIST standard thermometer. Dissolved oxygen probes will also be checked before (daily) use.

B.7.8 Laboratory QC Procedures

All bioassays will include a negative control, and a water-only, reference toxicant test to assess the sensitivity of each test population. The reference toxicant assays will be conducted by the laboratory on a regular basis for each test species.

Additionally, the biological QC elements detailed in the NAE QC summary tables, referenced in the RIM (EPA/USACE, 2004) and included in Appendix B will be adhered to, including test species age/health, control abnormality and mortality acceptance criteria and test-specific acceptability requirements.

B.7.9 Performance and System Audits

Bioassay programs include the use of reference toxicants to audit the performance of bioassay laboratory procedures. Laboratory system audits may be performed at the discretion of the NAE TM to ensure project personnel are performing project related tasks according to the project specific Work Plan and associated field and laboratory SOPs.

Laboratory Audit

ESI laboratory audits are conducted periodically by AECOM as part of their analytical subcontractor monitoring program. A typical systems audit includes review of the following areas:

- QA organization and procedures,
- Personnel training and qualifications,
- Sample log-in procedures,
- Sample storage facilities,
- Analyst technique
- Adherence to laboratory SOPs and project Work Plan,
- Compliance with QA/QC objectives,
- Equipment calibration and maintenance,
- Data recording, reduction, review, and reporting, and
- Cleanliness and housekeeping.

Preliminary results of the audit are discussed with the Laboratory Manager, Laboratory Project Manager, and Laboratory QA Coordinator. A written report that summarizes audit findings and recommends corrective actions is prepared and submitted to the Laboratory Manager for response, and to the AECOM Project Manager.

Data Package Audits

Audits of bioassay reports will be conducted for 100% of the packages received as part of the data review process. The review will include an evaluation of the package to ensure that (1) all required deliverables are provided, (2) the package contains the information necessary to reproduce the reported results, and (3) the

QC acceptance criteria specified in the Work Plan were met. Any deficiencies will be communicated to the laboratory and documented in the project files.

Audit Samples

Audit samples will be incorporated into the program as discussed in the Laboratory QC Procedures section above. Reference toxicant results will be reviewed by the Biology/Bioassay Laboratory Coordinator and compared to the acceptable limits provided by the vendor. Failure to meet the acceptance criteria will result in the review of the results and supporting data by the laboratory to identify the cause of the failure. Depending on the outcome of this review, subsequent corrective actions may include the following:

- Qualification/flagging of affected data,
- Discarding affected data and re-analysis, or
- Discarding affected data, re-sampling, and re-analysis.

B.7.10 Nonconformance & Corrective Actions

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter Work Plan specification nonconformance, unacceptable procedures, or out-of-limit QC performance that can affect data quality. All corrective action proposed and implemented will be documented as detailed in Section B.13 Reports.

Corrective action should only be implemented after approval by the AECOM Task Order Manager, or her designee.

Biological Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during, and after initial analyses. A number of conditions such as low/high water quality readings may be identified. Following consultation with laboratory personnel, it may be necessary for the Laboratory QA Coordinator to approve the implementation of corrective action. If the nonconformance causes project objectives not to be achieved, the AECOM Task Order Manager will be notified.

These corrective actions are performed prior to release of the reports from the laboratory. The corrective action will be documented in both the laboratory's corrective action files, and in the narrative report sent from the laboratory to the AECOM Biology/Bioassay Laboratory Coordinator and the AECOM Task Order Manager. If the corrective action does not rectify the situation, the laboratory will contact the AECOM Task Order manager who, in concert with the AECOM Biology/Bioassay Laboratory Coordinator and NAE's TM, will determine the action to be taken and inform the appropriate personnel.

B.8 Data Reduction/ Calculation of Data Quality Indicators

In addition to measurement sensitivity discussed previously, data usability will depend on the measurement accuracy and precision, as indicated by the corresponding accuracy and precision QC samples (i.e., method & equipment blanks, matrix spike samples, laboratory control samples (LCSs), standard reference materials (SRMs), and replicates). The field and laboratory data collected during this investigation will be used to achieve the objectives identified in this QAPP. The QC results associated with each analytical parameter for each matrix will be compared to the measurement objectives presented herein.

This section details the calculation of these DQIs.

B.8.1 Accuracy Assessment

One measure of accuracy will be R, which is calculated for matrix spikes, surrogates, LCSs, and SRMs. Percent recoveries for matrix spike results will be determined according to the following equation:

$$\%R = \frac{(Amount\ in\ Spiked\ Sample - Amount\ in\ Sample)}{Known\ Amount\ Added} \times 100$$

Percent recoveries for LCS, SRM, and surrogate compound results will be determined according to the following equation:

$$\%R = \frac{Experimental\ Concentration}{Known\ Amount\ Added} \times 100$$

An additional measure of accuracy is blank contamination. The blanks associated with this project include laboratory method blanks and equipment rinsate blanks. The results of the laboratory and field blanks will be compared to the objectives in stated Section B.3.2 of the QAPP. Failure to meet these objectives may indicate a systematic laboratory or field problem that should be investigated and resolved immediately. Associated data may have limitations placed on its use, depending on the magnitude of the problem.

B.8.2 Precision Assessment

The RPD between sample replicates is calculated to compare to precision objectives. The RPD will be calculated according to the following formula.

$$RPD = \frac{(Amount\ in\ Sample\ 1 - Amount\ in\ Sample\ 2)}{0.5(Amount\ in\ Sample\ 1 + Amount\ in\ Sample\ 2)} \times 100$$

Failure to achieve precision objectives may result in the associated data having limitations placed upon its use.

Completeness Assessment

Completeness is the ratio of the number of valid sample results to the total number of samples analyzed with a specific matrix and/or analysis. Following completion of the analytical testing, the percent completeness will be calculated by the following equation:

$$Completeness = \frac{(number\ of\ valid\ measurements)}{(number\ of\ measurements\ planned)} \times 100$$

Failure to meet the completeness objective will require an assessment to determine if the missing or invalid data are critical to achieving the project objectives. Corrective actions may include re-sampling or re-analysis, depending on the type of problem, logistical constraints, etc.

B.8.3 Comparison to Project Objectives

In addition, the data obtained will be both qualitatively and quantitatively assessed on a project-wide, matrix-specific, and parameter-specific basis. Factors to be considered in this assessment of field and laboratory data will include, but not necessarily be limited to, the following:

- Conformance to the field methodologies proposed in the FSP and QAPP,
- Conformance to the analytical methodologies provided in the QAPP,
- Adherence to proposed sampling strategy,

- Presence of elevated detection limits due to matrix interferences or contaminants present at high concentrations,
- Unusable data sets based on the data review results,
- Data sets identified as usable for limited purposes based on the data review results,
- Status of all issues requiring corrective action, as presented in the QA reports to management,
- Effect of nonconformance (procedures or requirements) on project objectives,
- Adequacy of the data as a whole in meeting the project objectives, and
- Identification of any remaining data gaps and need to reevaluate project decision rules.

This assessment will be performed by the technical team, in conjunction with the Project QA Officer, and the results presented in the final report.

B.9 Laboratory Operations Documentation

Laboratory data reduction procedures will be performed according to the following protocol. All information related to analysis will be documented in controlled laboratory logbooks, instrument printouts, or other approved forms. All entries that are not generated by an automated data system will be made neatly and legibly in permanent, waterproof ink.

Information will not be erased or obliterated. Corrections will be made by drawing a single line through the error and entering the correct information adjacent to the cross-out. All changes will be initialed, dated, and, if appropriate, accompanied by a brief explanation. Unused pages or portions of pages will be crossed out to prevent future data entry. Analytical laboratory records will be reviewed by the supervisory personnel on a regular basis, and by the Laboratory QA Coordinator periodically, to verify adherence to documentation requirements.

Data and report deliverables will be provided within the turnaround time specified in **Table A-3** of the FSP. The laboratory will provide at least one report in a printed document format (PDF) and one EDD to the Chemistry Coordinator. Upon approval of this Work Plan, the required format of the EDD will be provided (per the RIM). The hard copy data package will include the information summarized below:

- Case narrative (see description below);
- Cross reference of field sample IDs and laboratory IDs;
- Method summary;
- COC documentation;
- Dates of sample extraction and analysis;
- Description of any data qualifiers used;
- Sample results, including units;
- Sample preparation information;
- Results for MS/MSDs, method or preparation/calibration blanks, LCSs, surrogate spikes, and laboratory duplicates; and
- Matrix-specific method detection limits (MDLs) and reporting limits (RLs).

The case narrative will include the client name, project name and number, date of issuance, and a discussion of any deviations from analytical strategy, technical problems, and QC failures or non-conformances. The report will be signed by the Laboratory Project Manager.

All laboratory reports will be maintained on the project website (along with all project related/generated information) with access only to designated AECOM and NAE personnel for a minimum period of five years.

B.10 Data Assessment Procedures

All data generated through field activities or through the analytical program will be reviewed prior to reporting. No data will be disseminated by AECOM until it has been subjected to the procedures summarized below.

B.10.1 Internal Laboratory Review

Prior to the release of any data from the laboratories, the data will be reviewed and approved by laboratory personnel. The review will consist of a tiered approach that will include reviews by the person performing the work, by a qualified peer, and by supervisory and/or QA personnel.

B.10.2 Validation of Analytical Data

Validation of the laboratory deliverables will be performed by AECOM. The laboratory data will be reviewed for the following, as appropriate to the method:

- Completeness of deliverable;
- Technical holding times;
- Laboratory and field blank contamination;
- Surrogate spike recoveries;
- MS/MSD recoveries and RPDs;
- Laboratory duplicate RPDs;
- LCS recoveries; and
- Field duplicate.

The evaluation will consist of a review of the data package narrative and QC result. If data are considered usable, no data qualification will occur. In the event that serious deficiencies in data quality are noted, the data may be rejected and considered unusable.

B.11 Verification and Validation Methods

B.11.1 Field Data Verification

Field records will be reviewed by the Field Services Task Leader to ensure that:

- Logbooks and standardized forms have been filled out completely and that the information recorded accurately reflects the activities that were performed.
- Records are legible and in accordance with good recordkeeping practices, i.e., entries are signed and dated, data are not obliterated, changes are initialed, dated, and explained.
- Sample collection, handling, preservation, and storage procedures were conducted in accordance with the protocols described in the FSP and QAPP, and that any deviations were documented and approved by the appropriate personnel.

B.11.2 Laboratory Data Verification

Prior to being released as final, laboratory data will proceed through a tiered review process. Data verification starts with the analyst who performs a 100% review of the data to ensure the work was done correctly the first time. The data reduction and initial verification process must ensure that:

- Sample preparation and analysis information is correct and complete,
- Analytical results are correct and complete,
- The appropriate SOPs have been followed and are identified in the project records,
- Proper documentation procedures have been followed, and
- All non-conformances have been documented.

Following the completion of the initial verification by the analyst performing the data reduction, a systematic check of the data will be performed by an experienced peer or supervisor. This check will be performed to ensure that initial review has been completed correctly and thoroughly and will include a review of

- Adherence to the requested analytical method SOP;
- Correct interpretation of chromatograms, mass spectra, etc.;
- Correctness of numerical input when computer programs are used (checked randomly);
- Correct identification and quantitation of constituents with appropriate qualifiers;
- Numerical correctness of calculations and formulas (checked randomly);
- Acceptability of QC data;
- Documentation that instruments were operating according to method specifications (calibrations, performance checks, etc.);
- Documentation of dilution factors, standard concentrations, etc.; and
- Sample holding time assessment.

A third-level review will be performed by the Laboratory Project Manager before results are submitted to clients. This review serves to verify the completeness of the data report and to ensure that project requirements are met for the analyses performed. A narrative to accompany the final report will be prepared by the Laboratory Project Manager.

B.11.3 Validation of Laboratory Deliverables

Data will be reviewed as described in Sections B.11 of the QAPP. Upon completion of the validation, a brief report will be prepared discussing the acceptability of the data.

B.11.4 Verification during Data Management

All manually entered data (e.g., field data) will be proofed 100% against the original. Electronic data will be checked 100% after loading against laboratory data sheets for completeness and spot checked for accuracy.

B.12 Reconciliation with User Requirements

The field and laboratory data collected during this investigation will be used to achieve the objectives identified in this QAPP. The QC results associated with each analytical parameter for each matrix will be compared to the measurement objectives presented in this QAPP.

B.13 Reports

In addition to any potential audit and/or corrective action reports, several progress reports are scheduled to be delivered prior to submission of the project draft and final reports. The scheduled reports are as follows:

Bulk Sediment Chemistry Progress Report

A written progress report will be provided immediately upon the receipt of laboratory results (anticipated within four weeks of the start analyses) to properly inform the decision-making process. Chemistry data will be provided in the NAE EDD spreadsheet format. A completeness checklist and Quality Control Summary sheets as prescribed in the RIM will be filled out and submitted with the progress report for all data reported.

Elutriate Chemistry Progress Report

A written progress report will be provided within five weeks of the start of elutriate preparation to properly inform the decision-making process. Chemistry data will be provided in the NAE EDD spreadsheet format. A completeness checklist and Quality Control Summary sheets as prescribed in the RIM will be filled out and submitted with the progress report for all data reported.

SPP Toxicity Test Progress Report

A written progress report, without statistical analysis, will be provided within one week from the SPP test completion. If the ammonia reduction SPP test option is implemented (Task 6.1), then those results will be included in the progress report, which will be provided within one week of Task 6.1 test completion. The report will include summaries of all procedures and present tabulated data for each test series and organism analyzed.

Statistical analysis will be performed upon approval from NAE of the written progress report. Statistical analyses will be performed following Appendix D2 of the Inland Testing Manual (EPA/USACE, 1998). In addition to the written report all data will be submitted in electronic transmittable spreadsheets.

Whole Sediment Acute Toxicity Test Progress Report

A written progress report for toxicity and bioassay testing, without statistical analysis, will be provided within two weeks from test initiation. The report will include summaries of all procedures and present tabulated data for each test series and organism analyzed.

Statistical analysis will be performed upon approval from NAE of the written progress report. Statistical analyses will be performed following Appendix D2 of the Inland Testing Manual. In addition to the written report all data will be submitted in electronic transmittable spreadsheets.

28-day Bioaccumulation Bioassay Progress Report

A written progress report for toxicity and bioassay testing, without statistical analysis, will be provided within eight weeks from test initiation. The report will include summaries of all procedures and present tabulated data for each test series and organism analyzed. In addition to the written report all data will be submitted in electronic transmittable spreadsheets.

Tissue Analysis Progress Report

A written progress report, without statistical analysis, will be provided within six weeks from the start of the task. Chemistry data will be reported in approved EDD spreadsheet formats (once the Work Plan is approved). A completeness checklist and Quality Control Summary sheets as prescribed in the RIM will be filled out and submitted with the progress report for all data reported.

Draft and Final Reports

A draft report will be prepared to allow NAE an opportunity to review and comment on the document before finalizing. In each case, the draft and final reports will be transmitted to NAE within the established schedule (FSP **Table A-3**) containing the following elements:

- Cover sheet, which includes contract number, statement of data authenticity, and official signature of release.
- Table of contents.

- Case narrative which shall include analytical methods used, field sample and laboratory number correlations, data qualifier definitions, and deviations from established QA/QC procedures with associated corrective action.
- Summary tables of chemical analyses and biological tests.
- Complete field report, which includes sampling procedures and any problems or deviations from the Work Plan encountered.
- Biological testing results (toxicity).
- Sample documentation which includes original Chain of Custody record, shipping documents, and cooler receipt forms.
- QA/QC information which shall include method detection limits for each analyte, spike recoveries including surrogate recoveries, measures of precision, and all control limits for accuracy and precision. The QA/QC samples analyzed for each batch of samples (maximum of 20 samples to a batch) consist of:
 - Method blank.
 - Laboratory Control Sample (LCS).
 - Matrix Duplicate (using sample from project).
 - Matrix Spike/Matrix Spike Duplicate (using sample from project).
 - SRM (if available with analyte concentrations comparable to the project).
- The water chemistry and toxicity data will also be presented in an EDD according to <http://www.nae.usace.army.mil/reg/rim.htm> under Data Reporting Requirements/Sediment Evaluation/EDD.
- Completion of the Completeness Checklist Table II-1 located under Appendix II of the RIM (Appendix B).

Delivery dates for all reports are provided on **Table A-3**. Project reports, along with all relevant project records will also be maintained on AECOMs project files with for a minimum period of five years.

B.14 References

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Attachment 1

Accident Prevention Plan

Provided under separate cover

Attachment 2

Grab Sampling Log

Sediment Grab Collection Record



Location ID Date Project #
 Sampler Contractor Vessel
 Weather
 Sampling Equipment Diameter in
 Target Northing Easting NAD83 Stateplane Feet

Grab Number Time 24hr Water Depth ft # Attempts
 Actual Northing Easting Distance from target ft
 Target Penetration Depth ft
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %
 Remarks
 RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number Time 24hr Water Depth ft # Attempts
 Actual Northing Easting Distance from target ft
 Target Penetration Depth ft
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %
 Remarks
 RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number Time 24hr Water Depth ft # Attempts
 Actual Northing Easting Distance from target ft
 Target Penetration Depth ft
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %
 Remarks
 RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Attachment 3

Daily Activity Logs



Daily Activity Log

New Haven Harbor Supplemental Evaluations
Reference Site Sampling and Sample Transport

USACE Contract No. W912WJ-17-D-0003
Delivery Order No. W912WJ-18-F-0109

Date: _____

Vessel/Sampling Platform:

Personnel (Name/Affiliation/Role):

Sampling Performed/Equipment Used:

Stations Sampled:

Health and Safety Issues:

Deviations from Approved Plan:

Dock Departure Time:

Dock Return Time:

Recorded by:

Attachment 4

COC Form



CHAIN OF CUSTODY RECORD

Page ___ of ___

Client/Project Name:			Project Location:					Analysis Requested										<u>Container Type</u> P - Plastic A - Amber Glass G - Clear Glass V - VOA Vial O - Other E - Encore		<u>Preservation</u> 1 - HCl, 4° 2 - H2SO4, 4° 3 - HNO3, 4° 4 - NaOH, 4° 5 - NaOH/ZnAc, 4° 6 - Na2S2O3, 4° 7 - 4°		
Project Number:			Field Logbook No.:																			
Sampler (Print Name)/(Affiliation):			Chain of Custody Tape Nos.:																			
Signature:			Send Results/Report to:			TAT:																
Field Sample No./Identification	Date	Time	C O M P	G R A B	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered												Lab I.D.	Remarks	

Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:	Analytical Laboratory (Destination):	
Signature:	Time:	Signature:	Time:		
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:		
Signature:	Time:	Signature:	Time:	Sample Shipped Via: Temp blank	
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:		
Signature:	Time:	Signature:	Time:		

Serial No. _____

Attachment 5
Corrective Action Form



Field Corrective Action Form
New Haven Harbor Supplemental
Sediment Evaluations

USACE Contract No. W912WJ-17-D-0003
Delivery Order No. W912WJ-18-F-0109

Date: _____

Document (plan or SOP title):

Activity:

Proposed Modification:

Effective Date:

Rationale:

Submitted by:

Date:

Chief Scientist Approval:

Date:

Task Order Manager Approval:

Date:

NAE Technical Manager Approval:

Date:

Attachment 6

EnviroSystems, Inc. Sample Receipt Condition Verification Form

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:

SDG No:

Project:

Delivered via:

Date and Time Received:

Date and Time Logged into Lab:

Received By:

Logged into Lab by:

Air bill / Way bill:

Air bill included in folder if received?

Cooler on ice/packs:

Custody Seals present?

Cooler Blank Temp (C) at arrival:

Custody Seals intact?

Number of COC Pages:

COC Serial Number(s):

COC Complete:

Does the info on the COC match the samples?

 Sampled Date:

Were samples received within holding time?

 Field ID complete:

Were all samples properly labeled?

 Sampled Time:

Were proper sample containers used?

 Analysis request:

Were samples received intact? (none broken or leaking)

COC Signed and dated:

Were sample volumes sufficient for requested analysis?

Were all samples received?

Were VOC vials free of headspace?

Client notification/authorization:

pH Test strip ID number:

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Field ID	LabID	M	Analyses Requested	CTR	PRES	

Notes and qualifications:

Attachment 7

Alpha Analytical Sample Receipt Condition Verification Form

Sample Delivery Group Summary



Alpha Job Number : L17XXXXX

Received :Month,Day, 2017

Reviewer :Sample Custodian

Account Name : AECOM

Project Number :

Project Name :

Delivery Information

Samples Delivered By : Alpha Courier

Chain of Custody : Present

Cooler Information

Cooler	Seal/Seal#	Preservation	Temperature(°C)	Additional Information
A	Absent/	Ice	2.0	
B	Absent/	Ice	2.0	

Condition Information

All samples on COC received? **YES**

Extra samples received? **NO**

Are there any sample container discrepancies? **NO**

Are there any discrepancies between sample labels & COC? **NO**

Are samples in appropriate containers for requested analysis? **YES**

Are samples properly preserved for requested analysis? **YES**

Are samples within holding time for requested analysis? **YES**

All sampling equipment returned? **NA**

Volatile Organics/VPH

Reagent Water Vials Frozen by Client? **NA**

Appendix A

Field Standard Operating Procedures

- ES-G-01 Field Records
- ES-G-02 Navigation
- ES-G-03 Equipment Decontamination
- ES-G-04 Custody
- ES-G-05 Packaging/ Shipping
- ES-S-01 Grab Sampling
- ES-W-01 Water Quality Data and Water Collection

Standard Operating Procedure

Field Records

Procedure Number: ES-G-01

Revision No.: 0

Revision Date: September 2017

Prepared by

Kristen Durocher

Maura Surprenant
AECOM Deputy Program Manager

Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____

Standard Operating Procedure Field Records

Contents

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Attachment 2	Field Corrective Action Form	

Standard Operating Procedure Field Records

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for documentation of field activities conducted under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program including sample collection events, field measurements, and site visits. Appropriate documentation of field activities provides an accurate and comprehensive record of the work performed, sufficient for a technical peer to reconstruct the day's activities and determine that necessary requirements were met. Field records also provide evidence and support technical interpretations and judgments. The procedures and systems defined in this SOP help ensure that the records are identifiable (reference the project task/activity), legible, retrievable, and protected from loss or damage. Specific information regarding field records to be kept can be found in the associated task order-specific Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP).
- 1.2 Field data may be recorded electronically or in field logbooks, standardized forms, annotated maps, or photos. This SOP provides general guidance on field recordkeeping; additional details for specific procedures (for example, chain of custody, sample collection) are provided in the SOPs for the individual task.
- 1.3 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Deviations from this SOP will be documented in the field records. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 Although record keeping itself does not generally pose significant health and safety risks, the tasks being implemented in the vicinity of individuals keeping records may require attention to safety practices. Project-related physical, chemical and biological hazards are addressed in the Accident Prevention Plan (APP).
- 2.2 Daily safety briefings will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risks of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are remedied to the satisfaction of the SSO.

3.0 Interferences

Not Applicable

Standard Operating Procedure Field Records

4.0 Equipment and Materials

The following equipment list contains materials that may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Bound field logbook
- Standardized field data sheets (refer to Section 5.3)
- Black ballpoint pen, Rite-in-Rain® pen, or black Sharpie® (or equivalent)
- Site maps
- Clipboard
- Three-ring binder or equivalent
- Camera (optional)
- Time piece
- Hand-held electronic recording device (optional) with EQUIS Data Gathering Engine (EDGE)™ software from Earthsoft, Intelligent Data Entry Form® (IDEF) software or equivalent
- Laptop, tablet or other portable electronic recording device (optional)

5.0 Procedures

5.1 General requirements

- 5.1.1** The field records will contain sufficient detail so that the collection effort can be reconstructed without reliance on the collector's memory.
- 5.1.2** Pertinent field information will be recorded legibly in a logbook and/or an appropriate standardized form (as described herein), or directly onto a portable electronic device, as described in Section 5.6. It is recommended that entries made by hand be made in black ballpoint pen.
- 5.1.3** Entries will be signed and dated. No erasures or obliterations will be made. A single line will be drawn through incorrect entries and the corrected entry written next to the original strikeout. Strikeouts are to be initialed and dated by the originator.
- 5.1.4** If a ballpoint pen cannot be used because of adverse weather conditions (rain or freezing temperatures), fine-point Sharpie® or Rite-in-Rain® pens are acceptable substitutes. If conditions are such that only pencil can be used, an explanation will be included in the logbook and the affected data will be photocopied, signed as verified copy, and maintained in the project files as documentation that the information has not been changed.

Standard Operating Procedure Field Records

- 5.1.5 Entries will be factual and observational (i.e., no speculation or opinion), and will not contain any personal information or non-project-related entries. Abbreviations and acronyms will be defined.
- 5.1.6 Field information will be recorded without delay – information recorded significantly after the fact will be dated as such.
- 5.1.7 Field activities and other events pertinent to the field activities will be documented in chronological order. Times will be recorded using Eastern Standard Time (EST) or Eastern Daylight Savings Time (EDT) notation for each entry.

5.2 Field logbooks

- 5.2.1 Field logbooks will be bound waterproof field books. Logbooks will be dedicated to the project and will not be used for any other project or purpose. Separate and dedicated logbooks will be kept for different operations running concurrently (e.g., sample collection on board the vessel, core processing, surface water collection on-board a vessel, surface water collection from the shore); individual tasks making up each operation will be maintained in the same logbook, if possible.
- 5.2.2 The cover and binding of each logbook will be labeled to identify the operation and dates included with the logbook; each page in the logbook will be consecutively numbered. Pages will not be removed or torn out of the logbook.
- 5.2.3 The title page of each logbook will contain the following:
 - AECOM contact, AECOM office location, and phone number;
 - A unique logbook number (assigned at the time the logbook is signed out)
 - Project name and AECOM project number; and
 - Start and end dates of work covered by the logbook.
- 5.2.4 To assist in the return of a field logbook in the event it is lost, the following will also be included on the title page: "\$25 Reward if found and returned to AECOM, 250 Apollo Drive, Chelmsford, Massachusetts 01824".
- 5.2.5 At the front of each logbook will be a page cross-referencing each author's printed name, signature, and initials.
- 5.2.6 A page header will appear on the first page of each day's notes in the logbook, and activities for each day will be recorded on a new page. The page header will include:
 - Name of author and other personnel on site (and affiliated organization if applicable);
 - Date;
 - Time of arrival (military time);

Standard Operating Procedure Field Records

- Proposed activity (task); and
- Current weather and tidal conditions, and weather forecast for the day.

5.2.7 An abbreviated header, containing at least the date, will appear at the top of each additional page for the active date.

5.2.8 The field logbook will provide a chronology of events. At a minimum, documentation in a logbook will include the following (unless documented on a standard form):

- Names of visitor(s), including time of arrival and departure, the visitor's affiliation, and reason for visit;
- Summary of project-related communications, including names of people involved and time;
- Time daily work commences and ceases;
- Start and stop times of new tasks;
- Start and stop times of significant stand-by time (work interruptions);
- Safety or other monitoring data, including units with each measurement;
- Deviations from approved scope of work, including the necessary approvals;
- Progress updates;
- Problems/delays encountered;
- Unusual events; and
- Signature or initials of author on every page.

Additional detail on the contents of the field logbook is provided in Table 1.

5.2.9 The logbook will cross-reference the field forms if necessary; however, whenever possible, details recorded on the standardized forms will not be replicated in the logbook.

5.2.10 If there are additional lines on the page at the end of the day's activities, a line will be drawn through the empty space, and initialed and dated, leaving no room for additional entries.

5.3 Standardized forms

5.3.1 Standard forms for field data are provided with each SOP. The Daily Activity Log is attached to this SOP (Attachment 1). This form will be completed each day of active work and transmitted to the Task Order Manager or his/her designee. Refer to the appropriate SOP (e.g., core processing) for the forms specific to that task.

5.3.2 The information collected on any field form may alternately be collected electronically by laptop/handheld as appropriate.

Standard Operating Procedure Field Records

5.3.3 The following rules apply to the standardized forms:

- Each form will be signed and dated by the person completing the form.
- There will be no blank spaces on the form – unused spaces will have “not applicable” or “not available” explanations.

5.4 Maps and drawings

5.4.1 Pre-existing maps and drawings that include notations made in the field (for example, relocating of sample locations) will be referenced in the logbook and, like all field records, include the project/task name and number, site identification, and be signed/dated by the person that prepared them.

5.4.2 Maps and drawings will include compass orientation and scale. Sketches will include points of reference and distances to the reference points.

5.5 Photographs and other photo documentation

Photographs or videos may be taken by the field team to help document site conditions, sample locations, or sample characteristics. Photographs and videos will be identified in the logbook or on the standard form by a unique numbering system. If photographs are collected by a digital camera, the file number as well as the photograph number will accompany the description of the photograph in the logbook. At a minimum, the date/time the photograph was taken, the general location, a brief description, and the photographer’s name will be recorded. For photographs taken with a cellular phone, the photo should be documented either by including an additional photo of information identifying the photograph, or by sending via text or email to another phone with appropriate information included. Additional information may include Differential Global Positioning System (DGPS) coordinates, direction the photographer was facing, and/or weather conditions. If necessary, an object will be included to indicate the scale of the object in the photograph.

5.6 Electronic files

5.6.1 Electronic recording devices may include data logging systems, laptops, or tablet computers.

5.6.2 Sufficient backup systems will be in place to protect against electronic data loss. Information will be saved to a disk or backed up immediately upon completion. The backup disk or other media (CD, flash drive) will then be stored in a secure location separate from the laptop or tablet.

5.6.3 Files will be uniquely identified and will be stored in the project files on the network in accordance with the FSPs . An unedited version of the file will be maintained and all subsequent manipulations tracked.

Standard Operating Procedure Field Records

6.0 Quality Assurance/Quality Control

- 6.1 Entries in the field forms will be double-checked by the field team members to verify the information is correct.
- 6.2 Completed field forms will be reviewed by the Field Services Task Leader and/or his/her designee to verify that the requirements are being met. At a minimum, this should occur at the end of each day. When the review is complete, the reviewer will append his/her initials and date to the pages reviewed for documentation purposes.
- 6.3 If information recorded in the field is transcribed to another format, the original record will be retained for comparison purposes.

7.0 Data and Records Management

- 7.1 Deviations to the procedures detailed in the SOP or approved plans will be noted in the field logbook or other appropriate field form at the time of occurrence and summarized on the Daily Activity Log (Attachment 1).
- 7.2 Proposed modifications to the SOPs or approved plans will be documented on a Field Corrective Action Form. An example Field Corrective Action Form is presented as Attachment 2.
- 7.3 Logbooks that are taken offsite from the field will be photocopied or scanned and filed at the end of each day to mitigate against the loss of historical entries should the logbook be lost in the field.
- 7.4 Field data forms and chain of custody will be filed in the office facility once they have been completed and distributed (if necessary), or at the end of each field day. These documents will be maintained in labeled three-ring binders or contained in some other organized manner that prevents loss.
- 7.5 Distribution of daily forms will be performed according to the needs of the project team and at the direction of the Field Services Task Leader or designee.

8.0 Personnel Qualifications and Training

- 8.1 Individuals executing these procedures will have read and be familiar with the requirements of this SOP and the corresponding plans (e.g., APP, FSPs, and QAPP). No specialized training is required. Nonetheless, these activities should be reviewed by the Field Services Task Leader, as described below.
- 8.2 The Field Services Task Leader is responsible for reviewing and approving the field records for accuracy, completeness, and conformance to the procedures in this SOP. The Field Services Task Leader is also responsible for ensuring that the field records are distributed to the appropriate personnel during field activities, ensuring that records are maintained properly on site, and for archiving the records upon completion of field activities.

Standard Operating Procedure Field Records

SOP No.: ES-G-01
Revision: 0
Date: September 2017
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9.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Standard Operating Procedure Field Records

SOP No.: ES-G-01
Revision: 0
Date: September 2017
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Table 1 Summary of Typical Field Information

General Information	Applicable Record¹
Project/task name/general location	All
Personnel on site (AECOM, clients, site contacts, regulators, oversight personnel, subcontractors, general public)	A, B
Results of phone calls, conversations (See FSPs) for project contact information)	B
Chronology of activities, including mobilization, investigatory activities, and demobilization	B
Weather conditions (initial and any changes; temperature, barometric pressure, wind conditions, precipitation)	B
Tidal and atmospheric information (if applicable)	B
Subcontractors, description of services to be provided, and any issues (equipment problems, corrective action, stand by time)	A, B
Health and safety (H&S) tailgate meetings, H&S monitoring	Refer to APP
Description of major equipment (survey vessels, sampling platforms, sampling devices) and any problems or conditions that might impact performance or data quality	A, B, F
Equipment decontamination	B
Any pertinent field observations such as difficulties in sampling or conducting measurements or unusual circumstances that could affect data quality (instrument problems, contamination sources)	B, D, F
Deviations from approved plan (schedule, relocation/elimination of locations, change orders), including rationale and approval	A, B, F
Sample collection and transfer summary, custody information from collection through analysis	C
Field measurements	
Description of Instruments (make, model, serial number) and inspection	B
Measurement date, time, location/station, results (units, any correction factors applied, calculations (if applicable)	D, E
Identity of person performing the measurements	D, E
Sampling information	
Equipment description and inspection	B, D, E
Sample selection criteria/rationale (if different from plan)	A, B, D, E
Sample location (GPS coordinates, depth, compass/distance from fixed points)	D, E
Sample description (recovery, moisture, color, odor, texture, general sediment profile/stratigraphy, artifacts)	D, E
Sample manipulations (homogenization, compositing, filtering, preservation)	D, E
Sample ID, segment/interval, date, time, and sampler identity	B, D, E
Sample parameters, containers (size/type), preservation	
Field and QC sample ID, storage container and conditions for each (sub)sample/parameter set	B, C, D, E

¹ Locations for this information may include but are not limited to: A: Daily Activity Log; B: Field Notebook; C: COC Form; D: Field Coring Log; E: Grab Collection Form; F: Field Corrective Action Form

Standard Operating Procedure Field Records

Attachment 1 Example of Daily Activity Log

Daily Activity Log	USACE Contract No. W912WJ-17-D-0003
USACE NAE ES	Delivery Order No. _____
Date: _____	
Vessel/Sampling Platform:	
Personnel (Name/Affiliation/Role):	
Sampling Performed/Equipment Used:	
Stations Sampled:	
Health and Safety Issues:	
Deviations from Approved Plan:	
Dock Departure Time:	
Dock Return Time:	
Recorded by:	

Standard Operating Procedure Field Records

Attachment 2 Example of Field Corrective Action Form

Field Corrective Action Form USACE NAE ES		USACE Contract No. W912WJ-17-D-0003 Delivery Order No. _____
Date: _____		
Document (plan or SOP title):		
Activity:		
Proposed Modification:		
Effective Date:		
Rationale:		
Submitted by:		Date:
Field Task Manager Approval:		Date:
Task Order Manager Approval:		Date:

Standard Operating Procedure

Navigation/Positioning

Procedure Number: ES-G-02

Revision No.: 0

Revision Date: September 2017

Prepared by

Kristen Durocher

Maura Surprenant
AECOM Deputy Program Manager

Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____

Standard Operating Procedure Navigation/Positioning

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Standard Operating Procedure Navigation/Positioning

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for positioning vessels under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. Positioning will be conducted to locate the vessel(s) with sufficient accuracy and precision to meet project objectives during sampling or measurement activities. Specific information regarding proposed sampling and/or measurement locations is provided in the task order-specific Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP).
- 1.2 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and the AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 The health and safety (H&S) considerations for the work associated with this SOP, including physical, chemical, and biological hazards, are addressed in the task order-specific Accident Prevention Plan (APP). The major H&S considerations for the work associated with navigating/positioning are the marine/on-water safety aspects of the program.
- 2.2 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risks of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are remedied to the satisfaction of the SSO.

3.0 Interferences

Differential global positioning system (DGPS) signal interferences/blockage can occur from time to time by bridges or other structures. These interferences can prevent system function until satellite signals are re-established. If insufficient satellite coverage occurs for proper function, the user will be alerted by the HYPACK system. In these cases the vessel will be repositioned to obtain better satellite coverage.

Standard Operating Procedure Navigation/Positioning

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Personal protective equipment (PPE) and other safety equipment, as required by the APP;
- Sampling vessel(s) adequately sized and equipped for the task and expected conditions, including high frequency (VHF) radio, ground tackle, and required U.S. Coast Guard safety gear;
- Navigation charts and sampling/measurement locations figure;
- Electronic navigation charts with pre-loaded waypoints for all sampling and measurement locations - refer to the FSP;
- DGPS Receiver with an accuracy of \pm one foot;
- DGPS External Antennas;
- Field laptop computer with HYPACK survey software;
- Equipment user manuals;
- Table of target sampling/measurement location coordinates;
- Assorted nautical equipment (e.g., anchors, lines, personal flotation devices);
- Logbook and ballpoint pen;
- Sample collection forms; and
- RTK DGPS positioning system with an accuracy of \pm 2 centimeters horizontal and 3 centimeters (optional).

5.0 Procedures

Sampling and measurement activities will be conducted from a vessel. In accordance with procedures outlined below, these vessels must be properly positioned and their position recorded before each activity can begin. The following describes the procedures that will be performed to accurately position sampling vessels at a designated sampling location, and the pertinent observations that will be recorded in the appropriate field notebook and/or data sheet.

Positioning will be achieved by using a DGPS integrated with HYPACK survey software in order to obtain the real time position of the vessel, in relation to planned sampling stations, displayed on an electronic nautical chart. Survey personnel will follow the appropriate sections of equipment user's manuals to ensure proper equipment operation and system performance..

Standard Operating Procedure Navigation/Positioning

5.1 Positioning the Vessel

This section gives the step-by-step procedures for vessel positioning. Observations made during vessel positioning will be recorded on the sample collection forms, other standardized forms, and/or logbook, as appropriate.

A DGPS will be used to establish locations during implementation of activities specified in the FSP. While this SOP provides general guidance and procedural steps, personnel performing positioning activities also will follow the appropriate sections of equipment user's manuals and have the manuals available for reference while operating the equipment.

The following procedures describe the steps to establish position at a location, as well as the steps to adjust the positioning if necessary to collect additional samples.

- 5.1.1** Obtain the appropriate form(s). Initiate the Daily Activity Log provided in SOP ES-G-01 (Field Records).
- 5.1.2** Obtain the target sampling/measurement locations. These locations will have been selected prior to commencement of field activities, as described in the FSP. The location of each target sampling location will be established in the local State Plane Coordinate System with respect to the North American Datum of 1983 (NAD83).
- 5.1.3** Enter the coordinates for each sampling location as a waypoint into the HYPACK software package. Confirm accuracy of each entry against the coordinates established in the corresponding FSP.
- 5.1.4** Configure the HYPACK system for the survey, including setting the survey grid to the local State Plane Coordinate System with respect to the North American Datum of 1983 (NAD83 - feet), and setting the "target ring" or maximum allowable offset based on task specific requirements listed in the FSP.
- 5.1.5** If less than sub-meter accuracy is required, a DGPS base station will be established over a shore-based marker prior to sampling or measurement operations. The operation and horizontal/vertical accuracy of the vessel mounted DGPS will be verified at another shore-based marker by recording observed horizontal and vertical (XYZ) data and comparing these data to the published XYZ data for a given point. After initial DGPS system verification, a temporary benchmark may be established at a location convenient to the vessel to facilitate daily DGPS system performance verification. DGPS system performance verification will be conducted twice per day and documented in the logbook and vessel data logger. The horizontal and vertical accuracy will be compared to shore-based markers to verify performance. Elevations will be recorded in North American Vertical Datum of 1988 (NAVD88) with an accuracy of +/- one foot.
- 5.1.6** Install the DGPS antennae in a safe location which accurately represents the actual sample or measurement collection point; (e.g., immediately adjacent to a coring well, or mounted to the A-frame).
- 5.1.7** Identify and approach actual sampling/measurement locations by using data from the DGPS/HYPACK system in the navigation mode (while observing other navigational "Rules of the Road"). The navigation mode provides information on heading, distance remaining,

Standard Operating Procedure Navigation/Positioning

and time remaining. This information is based on the selected waypoint location and the present location of the vessel.

- 5.1.8** For sediment sampling, the vessel will be secured by lowering spud poles once in position within the station "target radius". In water depths that preclude the use of spud poles, maneuver the vessel approximately 60 feet up-current (or up-wind in slack conditions) of the target, drop the anchor, and pay out anchor line until the vessel drifts within the "target radius". A second anchor set may be required to increase lateral stability under certain conditions.
- 5.1.9** For water column sampling, the vessel will be positioned over each sampling/measurement location with no contact with the bottom. The operator will utilize the onboard navigation system to attempt to maintain positioning of the vessel within 10 feet of the sampling/measurement location.
- 5.1.10** Once the vessel is on location (and secured as appropriate, for sediment sampling), note the coordinates from the DGPS unit and check the coordinates to verify that the vessel is within the pre-determined range of the target location as defined in the FSP. If not acceptable, adjust the vessel's location, and recheck the position. Repeat this process until the vessel's position is within acceptable range of the target. Record the actual sampling coordinates electronically (using HYPACK).
- 5.1.11** Once the coordinates are acceptable, perform the sampling or measurement activity at the location. Record final location coordinates on the appropriate form. For sediment sampling, final location coordinates will be recorded once the sampling device has penetrated the sediment to the target depth or refusal and prior to retrieval. For surface water sampling, final location coordinate will be recorded once the sample is being collected. Plot locations onto a master chart or use computer-based, real-time software to verify location.
- 5.1.12** To adjust the vessel's position to repeat an attempt at sediment sampling, the vessel will be moved by allowing it to rotate around the spud pole or by adjusting an anchor line until the new position for the sampling device has been established. Record the new position.
- 5.1.13** At the end of the sampling day, check the data loaded onto the DGPS units to verify the existence of locations where data were collected. Spot check the location data for accuracy. Download HYPACK navigation files to a portable data storage device and transfer data to an applicable secure project directory.

5.2 Elevation Measurements

- 5.2.1** In order to establish the elevation of the sediment surface at locations within a body of water, a system will be established whereby the water level of that water body is continuously monitored and recorded for use as a local reference (e.g., local NOAA station).

5.3 Calibration, Maintenance, and Use of Field Instruments

5.3.1 Poor DGPS Reception or System Failure

If insufficient satellite coverage occurs for proper function, the user will be alerted by the HYPACK® system or the DGPS unit. In these cases, the Field Services Task Leader will

Standard Operating Procedure Navigation/Positioning

be notified that verification of the field position of the vessel or sampler on foot at the target location cannot be performed. The Field Task Manager will review the situation with respect to available reference resources and may provide the field team with alternate locations, as required by the FSP. The selection of alternate sampling locations will be made jointly through discussions with the Field Services Task Leader, sampling personnel and/or the Task Order Manager.

When satellite reception is insufficient to meet system accuracy requirements, system error codes will appear on the output screen. Nonetheless, proper operation of the DGPS / HYPACK navigation system can be verified by checking the displayed position on the electronic base map against surrounding geographic features. This activity will be undertaken at the start of each day after start-up as a quick check to verify proper system function. Note: system function errors will be obvious and rigorous checking of the system is not necessary.

5.3.2 Maintenance

Prior to use, the DGPS units will be inspected for functionality. Maintenance and use of DGPS units will follow the appropriate sections of the equipment user's manual. Field personnel will have the manual available for reference. Equipment maintenance will be recorded in the field logbook, including the reason for the maintenance (routine or because of a problem), actions taken, and final resolution (e.g., correction of the problem, replacement of the instrument).

6.0 Quality Assurance/Quality Control

- 6.1 Actual sampling/measurement locations will be verified as being within the FSP-specified radius/tolerance surrounding the target coordinates specified in the FSP. Using a navigational software system allows the user to see the real time position of the sampling vessel in relation to the designated position of the sampling/measurement station and the user defined "target radius" surrounding each station. This visual confirmation on the electronic chart is also complemented by a data display that indicates the actual distance to target. Using these two features ensures proper vessel positioning.
- 6.2 DGPS system performance will be verified by confirming the accuracy of the initial navigational software configuration (i.e., geographic reference) and by regular system checks during the course of the day.
- 6.3 The quality of the data provided by the DGPS unit is monitored by the navigational software as another control feature built into the system. In the event there is degradation in DGPS signal quality, either by a reduced number of available satellites or satellite geometry, the navigational software system will alert the operator of the reduced quality of horizontal and vertical precision levels.
- 6.4 Data recorded manually and electronically (see Section 7.2) will be cross-checked for accuracy

Standard Operating Procedure Navigation/Positioning

7.0 Data and Records Management

- 7.1** Field records will be generated as outlined in SOP ES-G-01 (Field Records). This document provides specifics on recording data for field activities. At a minimum, sample position information (x, y, and z), verification of DGPS system performance, and any positioning-related problems encountered will be recorded. Additional information may be required for sample collection or measurement activities and are outlined in the relevant SOPs.
- 7.2** Position data will be saved electronically at the time of sampling within HYPACK and recorded manually on the sample collection/measurement forms. The electronic record represents the primary record and the sample collection/measurement form information will serve as a backup to the electronic file.
- 7.3** Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). Proposed modifications to this SOP will be recorded on a Field Corrective Action Form (refer to SOP ES-G-01 – Field Records), including reason and impact on the program, and will be submitted to the AECOM Task Order Manager for approval.
- 7.4** All records (electronic and hard copy) associated with the activities described in this SOP will be maintained in accordance with the FSP.

8.0 Personnel Qualifications and Training

The individuals executing these procedures must have read, and be familiar with, the requirements of this SOP and the corresponding project plans (e.g., APP, FSP, and QAPP). Vessel navigation and positioning by vessel will only be performed by experienced RTK DGPS / HYPACK operators from the vessel subcontractors

9.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Standard Operating Procedure

Equipment Decontamination

Procedure Number: ES-G-03

Revision No.: 0

Revision Date: September 2017

Prepared by

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Date: _____

Debra L. Simmons
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Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____

Standard Operating Procedure Equipment Decontamination

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Standard Operating Procedure Equipment Decontamination

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for decontamination of equipment, instruments, and other materials used during implementation of field tasks under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. Decontamination is the process of neutralizing, washing, and rinsing exposed surfaces of equipment to minimize the potential for contaminant migration and/or cross-contamination. Specific information regarding equipment that will be used and necessary decontamination can be found in the associated task order-specific Quality Assurance Project Plan (QAPP) and, Field Sampling Plan (FSP). This procedure does not apply to personnel decontamination which is described in the task order-specific Accident Prevention Plan (APP).
- 1.2 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications to this SOP may be warranted depending upon field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 The health and safety considerations for the work associated with this SOP, including physical, chemical and biological hazards, are addressed in the APP.
- 2.2 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risks of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are remedied to the satisfaction of the SSO.

3.0 Interferences

- 3.1 Equipment decontamination should be performed in an area that does not interfere with sampling activities, but sufficiently close to maintain an efficient working environment. Whenever possible, decontamination activities will be performed in a location that is not subject to potential sources of contamination (for example, generators and other combustion engines). Where decontamination is required on a boat, the vessel's engines must be turned off during decontamination. Ideally, boat engines and/or generators should be shut off during collection of equipment blanks, consistent with collection of surface water samples. If this is not possible, then the sampling platform should be positioned upwind from any running combustion engines.

Standard Operating Procedure Equipment Decontamination

3.2 Equipment that is improperly or inadequately decontaminated may result in biased sample results. To avoid sample contamination, the procedures and equipment specified in this SOP are to be followed. Specifically:

- The decontamination materials, including detergent, water, and solvents will meet the specifications of the SOP;
- Buckets and other containers holding decontamination solutions will be labeled to segregate containers holding “dirty” from “clean” solutions, and brushes will be dedicated to a particular step in the decontamination process; and,
- Decontaminated equipment that is not immediately reused will be covered/wrapped in plastic or aluminum foil and marked to indicate it is clean.

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- personal protective equipment (PPE) and other safety equipment, as required by the APP;
- bristle brushes;
- plastic wash/rinse buckets or tubs;
- phosphate-free biodegradable detergent (e.g. Liquinox®);
- acetone wipes or similar (for oily residues);
- deionized "analyte-free" water (DIW);
- stainless steel bowls or pans (labeled as needed);
- squeeze or spray bottles (Teflon® for solvent);
- aluminum foil;
- plastic sheeting;
- zipper-lock bags;
- tap water (from any treated municipal water supply);
- sample container(s) for equipment rinsate blank, if collected;
- temporary storage containers for investigation-derived waste (IDW) storage containers (if needed); and
- field logbook and standardized forms as needed.

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5.0 Procedures

Non-dedicated sampling equipment that comes into contact with the media to be sampled will be decontaminated prior to use in the field to eliminate or minimize cross-contamination. The frequency of decontamination is provided in the task-specific SOPs (for example, surface water sampling, grab sampling, sediment core collection, core processing). Sufficient decontaminated equipment will be available to be dedicated to the sampling locations planned for each day, where feasible. Equipment will be decontaminated in the area designated for decontamination.

Sampling equipment will be decontaminated as described in Section 5.0 below. Decontamination of the sampling equipment will be commensurate with the analyses to be performed.

Not all sampling equipment will require full decontamination procedures. Three levels of decontamination (i.e., solvent, soap and water, or ambient water decontamination) will be performed based on the usage of the sampling equipment as defined below.

5.1 General preparation

Inspect equipment needed for sample collection to ensure that it is in good working order and establish an equipment decontamination area that includes a collection basin that can be placed beneath the equipment to collect decontamination fluids, brushes, and a series of wash bottles for each of the solutions specified in the following sections.

5.2 Level I (Decontamination with Ambient Water): The following steps will be used to decontaminate sampling and support vessels, vessel anchors, lines, ropes, and buoy marker weights associated with sediment sampling:

- 5.2.1 Personnel will dress in suitable PPE to reduce exposure to contaminants (refer to the APP).
- 5.2.2 Equipment will be rinsed with site surface water onboard the sampling vessel.
- 5.2.3 Rinse water will not be contained.
- 5.2.4 Daily decontamination of the decks of the vessels will consist of a surface water washing as soon as possible after concluding work. Further wash-down with tap water at the marina is at the discretion of the boat's captain.

5.3 Level II (Decontamination with Soap and Water): The following steps will be used to decontaminate non-dedicated sampling equipment that is used to collect samples for chemical analysis:

- 5.3.1 Personnel will dress in suitable PPE to reduce exposure to contaminants (refer to the APP).
- 5.3.2 Residual sediment, as appropriate, will be scraped off and the equipment rinsed with site surface water (on the sampling vessel while on site).
- 5.3.3 Residual sediment on equipment will be discharged overboard upon completion of sampling at a location.
- 5.3.4 Equipment may be rinsed with tap water if needed to further remove gross contamination.
- 5.3.5 Equipment will be placed in a wash tub or bucket (if size allows) containing Liquinox® (or other phosphate-free detergent) along with tap water, and scrubbed with a bristle brush or similar utensil.

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- 5.3.6 Equipment will be rinsed twice with tap water over a bucket using a squeeze bottle or pressure washer.
 - 5.3.7 Following decontamination, equipment will be placed in a dedicated clean area or will be protected from re-contamination by covering with plastic or wrapping in foil.
 - 5.3.8 Rinse water and detergent water will be replaced frequently. Residual decontamination water used on the boat will be held in 5-gallon buckets and discharged overboard upon completion at a station.
- 5.4 Level III (Decontamination with Solvents): The following steps will be used to decontaminate small sampling equipment that comes into contact with sediment or surface water with oily residues designated for chemical analysis. This sampling equipment may include such items as stainless steel trowels, spoons and bowls, stainless steel core cutters and catchers, plastic caps for the core tubes, and trigger-activated bottle samples. Sampling devices will be decontaminated between collection of samples at different depths and different times at the same sampling location. Details of when equipment is decontaminated is provided in the activity-specific SOPs.
- 5.4.1 Personnel will dress in suitable PPE to reduce exposure to chemicals and contaminants (refer to the APP).
 - 5.4.2 Any residual sediment will be scraped off and the equipment rinsed with site surface water (on the vessel while on site).
 - 5.4.3 Equipment may be brushed and rinsed with tap water if needed to further remove gross contamination.
 - 5.4.4 Equipment will be placed in a wash tub or bucket containing Liquinox (or other phosphate-free detergent) along with tap water, and scrubbed with a bristle brush or similar utensil. Equipment will be rinsed with tap water over a second wash tub or bucket, using a squeeze bottle or pressure sprayer, followed by cleaning with an acetone wipe.
 - 5.4.5 Following decontamination, equipment will be placed in a clean area on clean aluminum foil or plastic sheeting and allowed to air dry. Following air drying, the equipment will be wrapped in aluminum foil or placed in a zipper-lock bag, if not immediately re-used for sample collection. Larger equipment may be wrapped in clean plastic sheeting. Equipment that may be used immediately (i.e., before fully air dried) may be reused providing obvious water has been shaken off. Clean equipment should be marked in some way to indicate that it is clean.
 - 5.4.6 Used decontamination non-solvent solutions and associated materials will be collected in 5-gallon buckets and discharged overboard upon completion at a station.
 - 5.4.7 Acetone wipes will be placed in an open container and allowed to air-day as practical. Dried acetone wipes will be disposed of with PPE.
- 5.5 Field instrumentation should be cleaned according to the manufacturer's instructions. Care will be taken to prevent damage to equipment. Field instruments such as water quality meters will be rinsed daily during field operations at the end of each workday with tap or Site water at a minimum, or more rigorously according to the manufacturer's instructions. When possible, instruments which are difficult to decontaminate, such as cameras and data logging instruments, may be protectively wrapped to reduce or eliminate the need for decontamination.
- 5.6 Peristaltic pumps used for surface water sampling will be rinsed with tap water prior to and following each day of use. Decontamination of the pump between wells, stations or between depths is not

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required. Decontamination of other pumps (e.g., bladder pumps, diaphragm pumps) between stations and depths is required.

- 5.7** Submersible pumps, if needed, will be decontaminated using Level II procedures.
- 5.8** Tubing, bladder pump bladders, and bailers will be dedicated to sample locations and will not require decontamination in the field.
- 5.9** Other sampling equipment that might be used and that has had direct contact with sediments or wastes will initially be decontaminated at a designated area prior to leaving the Site. If the above decontamination procedures are not applicable or feasible, the decontamination procedure will be as follows:
- 5.9.1** Equipment will be wrapped or draped in plastic or placed in the plastic-lined cargo area of a truck for transport to the area designated for decontamination.
 - 5.9.2** Equipment will first be washed with a hot water, high-pressure spray or steam-cleaned.
 - 5.9.3** Equipment will then be rinsed, by hose or high pressure spray, with tap water.
 - 5.9.4** Decontamination rinse and wash water generated between surface water or sediment sample locations will be discharged overboard upon completion at a station.
- 5.10** Equipment leaving the Site upon the completion of on-site investigation activities will be decontaminated according to Sections 5.2, 5.3, 5.4, 5.5, or 5.6, above.
- 5.11** Equipment rinsate blanks will be collected to assess the adequacy of equipment decontamination procedures. Equipment rinsate blanks will be submitted for testing at the frequency specified in the QAPP. The equipment rinsate blank collection procedures are included in the SOPs for the individual tasks (e.g., surface water sampling, sediment sampling, core processing, groundwater sampling, etc.).

6.0 Quality Assurance/Quality Control

- 6.1** Decontamination quality assurance/quality control (QA/QC) procedures described in Section 5.0 will be performed to assess the adequacy of equipment decontamination procedures. Equipment rinsate blanks will be collected at the frequency specified in the QAPP.
- 6.2** It is the responsibility of the Field Services Task Leader to periodically check/ensure that the equipment decontamination procedures are in conformance with those stated in this SOP.

7.0 Data and Records Management

- 7.1** Documentation of decontamination procedures will be contained in the field logbook or recorded on the appropriate task-specific standardized form and should include:
- a list of equipment being decontaminated along with the date and time;
 - a brief description of the procedure and materials used during the process (e.g., Level I/ambient water rinse; Level II/soap and water rinse; Level III/solvent rinse);
 - the names of the project staff performing the decontamination; and,

Standard Operating Procedure Equipment Decontamination

- documentation of equipment rinsate blanks including sample ID, date and time, the equipment rinsed, collector, and parameters.

7.2 Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). Proposed modifications to this SOP will be recorded on a Field Corrective Action Form (refer to SOP ES-G-01 – Field Records), including reason and impact on the program, and will be submitted to the AECOM Task Order Manager for approval.

7.3 All records associated with the activities described in this SOP will be ultimately maintained in accordance with the QAPP.

8.0 Personnel Qualifications and Training

8.1 Individuals executing these procedures will have read, and be familiar with, the requirements of this SOP and the corresponding plans (e.g., APP, FSPs and QAPP). Decontamination of field equipment is a relatively simple procedure; no specialized training is needed. However, execution of these activities will initially be supervised by more experienced personnel.

8.2 The Field Services Task Leader is responsible for ensuring the procedures for decontamination in this SOP are followed.

9.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Standard Operating Procedure

Sample Custody

Procedure Number: ES-G-04

Revision No.: 0

Revision Date: September 2017

Prepared by

Kristen Durocher

Maura Surprenant
AECOM Deputy Program Manager

Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____

Standard Operating Procedure Sample Custody

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Attachment 1 Example Chain-of-Custody Form

Standard Operating Procedure

Sample Custody

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for the chain-of-custody (COC) procedures associated with samples collected under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. The objective of COC procedures is to provide sufficient evidence of sample integrity to satisfy data defensibility requirements. Samples may include sediment or water collected or generated for chemical, biological, and/or physical analyses, and associated quality control (QC) analysis. Specific information regarding samples collected can be found in the associated task order-specific Quality Assurance Project Plan (QAPP), and Field Sampling Plan (FSP). This SOP is intended to be complete enough that: 1) the steps which could affect tracking, documentation, or integrity of samples are explained in sufficient detail and 2) different sampling personnel following these procedures will deliver samples to the laboratory which are equally reliable and consistent.
- 1.2 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and the AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 Although COC activities do not generally pose significant health and safety risks, sample exposure via external container residues may occur and much of the work going on in the vicinity of sample custodians requires attention to safety practices. Project-related physical, chemical and biological hazards are addressed in the Accident Prevention Plan (APP).
- 2.2 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risks of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are remedied to the satisfaction of the SSO.

3.0 Interferences

Not applicable.

Standard Operating Procedure

Sample Custody

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Personal protective equipment (PPE) and other safety equipment, as required by the APP;
- Sample containers as specified in the Quality Assurance Project Plan (QAPP) Addendum;
- Sample labels;
- COC forms;
- Custody tape or seals;
- Field logbook;
- Ballpoint pen or fine-tipped marker (e.g., Sharpie®); and
- Clear plastic sealing tape.

5.0 Procedures

5.1 General requirements

5.1.1 As few people as possible should handle the samples.

5.1.2 Sampling personnel should be able to testify that tampering of the samples could not occur without their knowledge.

5.2 Sample identification

Each sample, including field samples and QC samples (e.g., equipment rinse blanks, field duplicates) will be assigned a unique identification. Refer to the QAPP and FSP for the sample identification protocol.

5.3 Sample labeling

5.3.1 A label will be attached to each bottle used for sampling. Waterproof, adhesive labels are preferred. Labels will be applied to the container, not the lid, whenever possible.

5.3.2 The project identification, sample matrix, laboratory designation/analyses requested, field sample identification code, and preservation will be typed or printed onto the label before sampling. The label will be protected from water and solvents with clear packing tape, except in cases where not appropriate.

5.3.3 Completion of the sample labels (including the sampler's initials and the date and time of sample collection) will occur at the time of sample collection. Labels will be completed in waterproof, indelible ink.

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Sample Custody

5.4 Sample tracking

- 5.4.1** From the time of collection through transportation, the handling of samples will follow COC procedures. A representative from each sampling team will be assigned as the field sample custodian. This individual will be responsible for the custody of the samples from collection until release for processing or shipment to the laboratories. The field sample custodian will provide a sample transfer/custody form and the completed and electronic versions of the sample collection forms (refer to task-specific SOPs) when relinquishing the collected samples for sample processing or shipment. The samples will be verified against the sample transfer/custody form. An example standard COC form is provided in Attachment 1.
- 5.4.2** A sample is considered under a person's custody if one or more of the criteria are met:
- Sample is in the person's possession;
 - Sample is in the person's view after being in person's possession;
 - Sample was in the person's possession and then was locked up to prevent tampering; or
 - Sample is in a designated secure area.
- 5.4.3** Samples collected for analysis will be continuously tracked and while in transit to the laboratory by use of the following procedures below.
- 5.4.4** Individual sample bottles will be properly labeled and securely sealed before being placed in the container for shipment to the laboratory.
- 5.4.5** Pertinent information will be entered on the COC form (Attachment 1) and will include:
- Project identification
 - Signatures of samplers;
 - Sample identification code. This code should be unique to the sampling event and to the program and must agree exactly with the field sample identification code recorded on the bottle label;
 - Date and time of sample collection,
 - Sample matrix (sediment, water, etc.);
 - Analyses requested;
 - Number of sample containers;
 - Preservative;
 - Grab or composite sample designation (if applicable);
 - Sampler's remarks (optional). These comments may serve to alert the laboratory to highly contaminated samples or identify QC sample requirements.
 - Signatures of individuals involved in sample transfer;
 - Destination (e.g., laboratory name and location);

Standard Operating Procedure Sample Custody

- Page number (for example: 1 of 2, 2 of 2);
- If applicable, COC tape numbers (example provided in Attachment 2); and
- If applicable, the air bill or other shipping number.

This information is consistent with guidance in SW 846, Test Methods for Evaluating Solid Waste (USEPA, 2017).

- 5.4.6** The COC will be manually filled out completely and legibly in indelible ink. COCs may be pre-printed with known information (project identification, parameters to be analyzed, etc.) or may be hand-written on pre-printed forms. Corrections will be made, if necessary, by drawing a single line through and initialing and dating the error. The correct information will then be recorded with indelible ink. There should be no unexplained blank spaces. Blank lines will be lined out and initialed and dated.
- 5.4.7** Each COC will be cooler-specific (i.e., list only the samples packed in the cooler). Information on the COC must agree exactly with that recorded on the sample containers. Discrepancies may result in the samples being incorrectly logged into the laboratory or delays in initiating sample analysis.
- 5.4.8** The completed COC form will be signed, dated, enclosed in a sealable plastic bag, and placed in the container prior to shipment/ transfer to a courier. A copy of the COC will be retained by field personnel and stored in a dedicated binder or file. Additional copies will be distributed via email or fax as follows:
- Project Chemist/Laboratory Coordinator or his/her designee;
 - Data Manager or his/her designee; and
 - Laboratory project manager at each laboratory being used.
- 5.4.9** If samples are to be shipped by commercial overnight carrier, COC seals must be used and the COC seal numbers recorded on the COC form. Refer to SOP ES-G-05 – Sample Packaging and Shipping for specific packaging procedures. Representatives of commercial carriers are not required to sign the COC form.
- 5.4.10** If samples are hand carried to a laboratory, custody will be maintained and documented on the COC form through the process (e.g., from the person packing the cooler to the person transporting the samples to the laboratory).
- 5.4.11** If samples are transmitted to the laboratory by courier, the procedures described in either Section 5.4.9 or 5.4.10 will be followed, depending on whether the courier is a commercial courier or laboratory representative, and whether the cooler has been secured by COC seals prior to pick up by a laboratory courier.
- 5.4.12** Upon receipt at the laboratory, the designated laboratory sample custodian will sign the COC form indicating receipt of the incoming field samples. The samples will be checked against the COC form upon arrival at the laboratory. The receiving personnel will enter all arriving samples into the laboratory system. Any discrepancies between the samples and the COC form(s), or any evidence of tampering with the shipping container or the custody seal will be immediately reported to the Project Chemist. The laboratory sample custodian will check the

Standard Operating Procedure Sample Custody

temperature of the cooler upon arrival at the laboratory and record the measured temperature on the COC and/or appropriate sample/cooler receipt forms. The Project Chemist will be immediately notified of any sample preservation issues, including temperature exceedances.

- 5.4.13** A completed copy of the COC form will be distributed via email or fax to the Project Chemist within 24 hours of sample receipt at the laboratory. The original will be retained by the laboratory.

6.0 Quality Assurance/Quality Control

- 6.1** Completed COCs will be reviewed by the individuals preparing the samples for shipment for completeness, accuracy, and legibility. Specifically, the samples and COC record will be compared to ensure agreement between the sample labels and the COC, and to verify the number of sample containers.
- 6.2** These records are subjected to periodic review by the Field Services Task Leader to verify adherence to the procedures outlined in this SOP.

7.0 Data and Records Management

- 7.1** The records associated with the custody process (transfer forms, COC records, air bills, etc.) will be maintained in an organized and contained manner.
- 7.2** COC records will be distributed to the appropriate personnel as described in the FSP and QAPP.
- 7.3** Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). Proposed modifications to this SOP will be recorded on a Field Corrective Action Form (refer to SOP ES-G-01 – Field Records), including reason and impact on the program, and will be submitted to the AECOM Project Manager for approval.

8.0 Personnel Qualifications and Training

- 8.1** Individuals executing these procedures will have read and be familiar with the requirements of this SOP and the corresponding plans (e.g., APP, FSP and QAPP). No specialized training is required; however, execution of these activities will initially be supervised by more experienced personnel.

9.0 References

United States Environmental Protection Agency. 2017. SW 846, Test Methods for Evaluating Solid Waste. Available online: <https://www.epa.gov/hw-sw846/sw-846-compendium>.

Standard Operating Procedure Sample Custody

10.0 Revision History

Revision	Date	Changes
0	September 2017	NA

**Standard Operating Procedure
Sample Custody**

Attachment 1 Example Chain-of-Custody Form

AECOM										CHAIN OF CUSTODY RECORD										Page ____ of ____									
Client/Project Name:					Project Location:					Analysis Requested										Container Type: P - Plastic A - Amber Glass G - Clear Glass V - VOA Vial O - Other E - Encore		Preservation: 1 - HCl, 4" 2 - H2SO4, 4" 3 - HNO3, 4" 4 - NaOH, 4" 5 - NaOH/ZnAc, 4" 6 - Na2S2O3, 4" 7 - 4"							
Project Number:					Field Logbook No.:															Matrix Codes:									
Sampler (Print Name)/(Affiliation):					Chain of Custody Tape Nos.:															DW - Drinking Water WW - Wastewater GW - Groundwater SW - Surface Water ST - Storm Water W - Water		S - Soil SL - Sludge SD - Sediment SO - Solid A - Air L - Liquid P - Product							
Signature:					Send Results/Report to:					TAT:																			
Field Sample No./Identification	Date	Time	C O M P	G R A B	Sample Container (Size/Mat#)	Matrix	Preserv.	Field Filtered												Lab I.D.	Remarks								
Relinquished by: (Print Name)/(Affiliation)					Date:					Received by: (Print Name)/(Affiliation)					Date:					Analytical Laboratory (Destination):									
Signature:					Time:					Signature:					Time:														
Relinquished by: (Print Name)/(Affiliation)					Date:					Received by: (Print Name)/(Affiliation)					Date:														
Signature:					Time:					Signature:					Time:					Sample Shipped Via:									
Relinquished by: (Print Name)/(Affiliation)					Date:					Received by: (Print Name)/(Affiliation)					Date:														
Signature:					Time:					Signature:					Time:					UPS		FedEx		Courier		Other		Temp blank	
																				Yes		No							

Standard Operating Procedure Sample Custody

Attachment 2 Example Chain-of-Custody Seal

No

Signature _____

Date _____

| AECOM

Standard Operating Procedure

Sample Packaging and Shipping

Procedure Number: ES-G-05

Revision No.: 0

Revision Date: September 2017

Prepared by

Kristen Durocher

Maura Surprenant
AECOM Deputy Program Manager

Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____
Initials: _____ Date: _____

Standard Operating Procedure Sample Packaging and Shipping

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Standard Operating Procedure Sample Packaging and Shipping

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for packaging and shipping samples collected under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. Sample packaging and shipment generally involves the placement of individual sample containers into a cooler or other similar shipping container and placement of packing materials and coolant in such a manner as to isolate the samples, maintain the required temperature, and to limit the potential for damage to sample containers when the cooler is transported. Specific information regarding samples to be collected sampling can be found in the associated task order-specific Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP).
- 1.2 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and the AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records. The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 Although packaging activities do not generally pose significant health and safety risks, sample exposure via external container residues may occur and much of the work going on in the vicinity of sample custodians requires attention to safety practices. Project-related physical, chemical and biological hazards are addressed in the task order Accident Prevention Plan (APP).
- 2.2 Sample packaging and shipping involves potential physical hazards primarily associated with handling of occasional broken sample containers and lifting of heavy objects. Adequate precautions will be taken, including minimizing the weight of individual coolers, using hand carts to transport coolers, and using the buddy system to lift coolers into and out of vehicles.
- 2.3 Daily safety briefs will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risks of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are remedied to the satisfaction of the SSO.

3.0 Interferences

Improper sample storage or inadequate protection against breakage and cross-contamination could potentially affect sample results. The field team will follow this SOP to minimize these effects.

Standard Operating Procedure

Sample Packaging and Shipping

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Personal protective equipment (PPE) and other safety equipment, as required by the APP;
- Inert packing material (e.g., foam peanuts, vermiculite, cardboard, bubble wrap, etc.);
- Sample containers as specified in the FSP and QAPP;
- Sample labels;
- Chain of custody (COC) forms;
- Insulated coolers;
- Custody tape or seals;
- Indelible marking pens;
- Shipping tape;
- Sealable plastic bags;
- Temperature blanks (provided by the laboratory);
- Field logbook;
- Ice or similar chilling source;
- Ballpoint pen or fine-tipped marker (e.g., Sharpie®); and
- Clear plastic sealing tape.

5.0 Procedures

5.1 General requirements

- 5.1.1 Vehicular sample transport will adhere to normal/applicable Department of Transportation (DOT) regulations. DOT regulations/guidelines related to sample shipments can be viewed on AECOM's Safety, Health & Environment (SH&E) intranet web page.
- 5.1.2 An area for storing unused sample containers/coolers and a clean area for sample handling, packaging, and shipment will be identified.
- 5.1.3 Laboratories will often re-use coolers. The interior and exterior of each cooler received at a project location should be inspected for cleanliness before using it. Any coolers that have cracked interior or exterior linings/panels or hinges should be discarded. Any coolers missing one or both handles should also be discarded if replacement handles (i.e., knotted rope handles) cannot be fashioned in the field.

Standard Operating Procedure Sample Packaging and Shipping

- 5.1.4** Excess strapping tape and old shipping labels should be removed. If the cooler interior exhibits visible contamination or odors it should be decontaminated in accordance with ES-G-03 – Equipment Decontamination prior to use.
- 5.1.5** The Field Services Task Leader or designee will notify the laboratory(ies) of the number, type and approximate collection and shipment dates for the samples in advance of any sample transfers and communicate any delays. The laboratory(ies) will provide courier service for all sample shipments.
- 5.2** Sample packaging and shipping will be done in accordance with applicable regulations, as described below:

 - 5.2.1** After filling a sample container, affix cap. For sediment/solids containers, secure the cap with clear tape; the use of plastic tape to secure the cap is not required for aqueous containers. Complete the sample label. Apply the label to the sample container and cover with clear tape.
 - 5.2.2** Clean the outside of each sample container by wiping it off with a clean paper towel. Verify that residual sediment has been removed from the outside of the container, and from the area under and around the cap.
 - 5.2.3** Place each glass sample bottle into an individual bubble bag sleeve provided by the lab or wrap each glass bottle/jar individually using bubble wrap secured with tape or rubber bands
 - 5.2.4** Seal each sample container inside a sealable plastic bag.
 - 5.2.5** For those samples that require thermal preservation, place on ice or similar chilling source immediately after collection.
 - 5.2.6** Place plastic bubble wrap matting in the bottom of each cooler or shipping container as needed.
 - 5.2.7** Transfer the samples to the plastic-lined cooler. Place bottles upright into the cooler. If a combination of plastic and glass sample containers are to be packed, alternate them within the cooler to further protect the glass. Use inert packaging material (e.g., cardboard, etc.) to cushion the samples and minimize the potential for breakage by placing additional packing material throughout the voids between sample containers and between any layers within each cooler to a level which meets the approximate top of the sample containers. Packing material may require tamping by hand to reduce the potential for settling. Seal the drains on the ice chest (if present) with shipping tape or plug the drains with silicone sealant or a similar inert substance.
 - 5.2.8** Conduct an inventory of sample numbers, fractions and containers when placing samples into the coolers, and check the inventory against the corresponding COC form before sealing the cooler (SOP ES-G-04 – Sample Custody).
 - 5.2.9** For those samples requiring thermal preservation, ice or similar chilling sources sufficient to maintain a temperature of $4^{\circ} \pm 2^{\circ}$ Celsius ($^{\circ}\text{C}$) will be placed inside the cooler during transport. Double bag cubed ice in heavy duty Ziploc type plastic bags to prevent leakage, close the bags, and distribute the packages in a layer over the top of the samples. If sample bottles are bubble wrapped, it is also permissible to insert double bagged ice packages between the sample bottles. Never place un-bagged loose ice directly into a cooler. Use

Standard Operating Procedure Sample Packaging and Shipping

sufficient ice to accommodate reasonable delays in shipment. A temperature blank provided by the analytical laboratory with each cooler will be included in the shipment.

- 5.2.10 If required, obtain two custody seals and enter the seal numbers on the COC form. Complete sample tracking documentation as described in SOP ES-G-04 (Sample Custody), and place the documents in a sealable plastic bag inside the ice chest, taped to the inside of the lid.
- 5.2.11 Secure chest lid with shipping tape by covering the entire seal with tape. Sign and date the two custody seals, affix the custody seals on opposing corners of the cooler lid and cover the seals with clear plastic tape.
- 5.2.12 Repeat the above steps for each cooler or shipping container. If more than one cooler is being delivered to a laboratory, mark each cooler as "1 of 2", "2 of 2", etc.
- 5.2.13 Transport the shipping container directly to the laboratory or the laboratory courier. Samples will be shipped by close of the same day, whenever possible.

6.0 Quality Assurance/Quality Control

- 6.1 Completed COCs will be reviewed by the individuals preparing the samples for shipment for completeness, accuracy, and legibility. Specifically, the samples and COC record will be compared to ensure agreement between the sample labels and the COC, and to verify the number of sample containers.
- 6.2 The laboratory will notify the Project Chemist within 24 hours of receipt in the event that samples are received broken, that there are sample preservation concerns or holding time exceedances, or there are discrepancies between the custody paperwork and the sample containers.
- 6.3 The procedures and records associated with sample packaging and shipping are subjected to periodic inspection and review by the Field Services Task Leader to verify adherence to the procedures outlined in this SOP.

7.0 Data and Records Management

- 7.1 The records associated with the shipment process (COC records, etc.) will be maintained in an organized and contained manner. Field notes will be kept during sampling activities in accordance with SOP ES-G-01 - Field Records.
- 7.2 COC records will be distributed to the appropriate personnel as described in SOP the QAPP and FSP.
- 7.3 Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). Proposed modifications to this SOP will be recorded on a Field Corrective Action Form (refer to SOP ES-G-01 – Field Records), including reason and impact on the program, and will be submitted to the AECOM Task Order Manager for approval.

Standard Operating Procedure Sample Packaging and Shipping

8.0 Personnel Qualifications and Training

Individuals executing these procedures will have read and be familiar with the requirements of this SOP and the corresponding plans (e.g., APP, FSP and QAPP). No specialized training is required; however, execution of these activities will initially be supervised by more experienced personnel.

9.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Standard Operating Procedure

Sediment Grab Sampling

Procedure Number: ES-S-01

Revision No.: 0

Revision Date: September 2017

Originally Prepared by

Rachel MacPhee

Maura Surprenant
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Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____

Initials: _____ Date: _____

Standard Operating Procedure Sediment Grab Sampling

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Attachment 1 Example Of Grab Collection Form

Attachment 2 Equipment Rinsate Blank Collection Procedure

Standard Operating Procedure

Sediment Grab Sampling

1.0 Scope and Applicability

- 1.1 The purpose of this document is to define the standard operating procedure (SOP) for collecting sediment grab samples using a grab sampler deployed from a boat or other sampling platform under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. Surface sediment samples will be collected for a variety of chemical, physical, and biological parameters. Grab samplers can include Van Veen grab samplers (including Ted Young modified), ponar grab samplers, power grab samplers, and box corers. This SOP describes the equipment, field procedures, materials, and documentation procedures necessary to collect grab samples. Specific information regarding grab sampling can be found in the associated task order specific Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). This SOP is based on United States Environmental Protection Agency (USEPA) guidance document Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual (USEPA, 2001).
- 1.2 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted based on field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project Quality Assurance (QA) Officer and the AECOM Task Order Manager. Deviations from this SOP will be documented in the field records and on a field corrective action form (SOP ES-G-01 – Field Records) including the reason for the deviation(s). The ultimate procedure employed will be documented in the report summarizing the results of the sampling event or field activity.

2.0 Health and Safety Considerations

- 2.1 The health and safety considerations for the work associated with this SOP, including physical, chemical, and biological hazards are addressed in the task order specific Accident Prevention Plan (APP).
- 2.2 The health and safety considerations for the work associated with grab sampling include:
- The physical hazards of handling heavy equipment,
 - Pinch hazards associated with the grab or box core sampler,
 - Overhead lifting hazards using boat based winches and A-frames,
 - Marine safety aspects of the program, and
 - The specific chemical hazards related to the sediments.
- 2.3 Daily safety briefings will be conducted at the start of each working day before any work commences. These daily briefs will be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risk areas covering every aspect of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are fully remedied to the satisfaction of the SSO.

Standard Operating Procedure Sediment Grab Sampling

3.0 Interferences

Grab sampler collection issues generally include mechanical failures, over penetration, or surface sediment loss. Each of these will affect the quality/representativeness of the resulting data. Any sampler that did not trigger properly, or did not completely close will be rejected. Samplers that are either over-filled or appear to have lost surface fines will also be rejected. These details are further discussed in Section 5 (Procedures).

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Coring/sampling vessel, including the necessary navigational, communication, and grab deployment equipment;
- Marine VHF radio;
- Van Veen (or Ted Young modified Van Veen) grab sampler;
- Ponar grab sampler;
- Stainless-steel power grab sampler with pneumatic ram and stainless steel guide;
- Box corer;
- Stand (cradle) on which to place the grab or box core while not in deployment;
- Siphon tubing and bucket or pipette;
- Source of running water (optional);
- Water pump and hoses (optional);
- First aid kit and personal protective equipment (PPE) (refer to APP);
- Approved plans, including target sampling locations;
- Sample containers (refer to the task order specific QAPP);
- Stainless steel bowls/trays and spoons/spatulas (or equivalent);
- Insulated coolers with wet ice;
- Sample labels;
- Waterproof paper and pen;
- Field notebook, Grab Collection Form, and other standardized forms (as needed);
- Ruler and tape measure;
- Digital camera (optional);

Standard Operating Procedure Sediment Grab Sampling

- Chain-of-custody forms and seals;
- Decontamination supplies (refer to SOP ES-G-03 – Equipment Decontamination).

5.0 Procedures

This section gives the step-by-step procedures for collecting grab samples using a grab sampler (Van Veen, Ted Young modified Van Veen, or power grab) or box corer. Observations made during sediment grab sample collection will be recorded on the Grab Collection Form (Attachment 1), and/or a logbook (SOP ES-G-01 - Field Records).

5.1 Equipment decontamination

The grab sampler or box corer, stainless steel bowls/containers, and stainless steel spoons/spatulas will be cleaned prior to initial use and between each station following the procedures in SOP ES-G-03 and documented in the field notebook. A sufficient supply of pre-decontaminated small equipment will be mobilized to the sampling locations to minimize the need for performing field decontamination. Larger equipment, such as a grab or box core, will, however, require field decontamination on the vessel between sampling stations. Note: grabs or box corers will not require decontamination between deployments at the same station; only between sampling stations, unless sticky or tar-like materials are encountered.

5.2 Equipment rinsate blanks

Equipment rinsate blanks will be collected at the frequency specified in the task order specific QAPP after the sampling gear is decontaminated. The procedure for collecting equipment rinsate blanks and related sample containerization requirements are detailed in Attachment 2.

5.3 Positioning

5.3.1 The sediment sampling schedule for the day will be established prior to vessel departure, and sufficient equipment to complete the work will be on-board the sampling/coring vessel. Grab samples are anticipated to be collected adjacent to core collection locations.

5.3.2 The sampling/coring vessel will move to a grab/coring location in accordance with SOP ES-G-02 (Navigation Positioning).

5.4 Sampling preparation

The associated QAPP summarizes the parameters that require collection at each station, and list the sample mass, container type, preservatives, and storage conditions required for each sample.

5.5 Sampler Deployment and Retrieval

5.5.1 Don PPE as required by the APP.

5.5.2 Attach the sampler (grab sampler or box corer) to the end of the winch cable with a shackle and tighten the pin.

Standard Operating Procedure

Sediment Grab Sampling

- 5.5.3** Attach any needed weights to achieve the needed penetration or pads (boards) for stabilization. Arm the grab/box corer.
- 5.5.4** Lower the sampler through the water column until the cable slackens. Nearing the bottom travel time will not exceed 1 m/sec to minimize bow wave disturbance. Record the station location (HYPACK system) and water depth (echo sounder or weighted line) on the Grab Collection Form (Attachment 1).
- 5.5.5** Retrieve the sampler and place it on the stand.
- 5.5.6** Open the sampler and examine it for acceptability:
- The sediment surface should be basically level and intact over the surface area of the grab, with no sign of channeling or sample washout
 - Penetration depth should be sufficient (as measured from the center of the grab) to meet the project requirements
 - The jaws of the sampler should be tightly closed and water should not be substantially leaking from the sampler
 - The surface appears intact (shell hash or coarse material visible on the surface is acceptable as long as the first two criteria are met and the jaws of the grab are tightly closed and not leaking).
 - Grabs that are only partially filled, or obviously slumped or pitched due to the sampler hitting at an angle are not considered acceptable. In addition, sediments should not be in contact with the underside of the sampler access doors. Drain overlying water from the sampler (by siphoning, not decanting) until only a thin film remains.
- 5.5.7** Describe the sample surface (color, texture, odor, etc.) on the Grab Collection Form (Attachment 1); continue to describe the sample during sample processing.
- 5.5.8** Collect the sample as described below. Future deployments will be adjusted for local sediment conditions by either adding/removing weight or pads to the grab frame to control the penetration depth.
- 5.5.9** Repeat steps 5.5.4 through 5.5.9 until sufficient grab samples are collected to meet the sample volume requirements for the full set of parameters as specified in the FSP and QAPP. Care will be taken to ensure that the precise collection interval/horizon specified in the corresponding FSP is collected. Slight adjustments/relocation of the vessel on-station between sampler deployments will be performed according to SOP ES-G-02.
- 5.6** Shipboard sample collection
- 5.6.1** Siphon off the overlying water (or remove via pipette) to the sediment/water interface without substantially disturbing the soft surface sediment. This will be performed by gently allowing the water to drain to one corner of the sampler for siphoning-off.
- 5.6.2** Sediment to be homogenized (for non-discrete sample parameters) will be placed in a covered plastic bucket (e.g., 3 ½ gallon bucket) provided by the laboratory.
- 5.6.3** Store the sample containers in an insulated cooler containing wet ice to keep samples cold while on the vessel until they can be transported to shore for further processing or shipment to the corresponding analytical laboratory as described in SOP ES-G-05 (Sample Packaging and Shipping).

Standard Operating Procedure Sediment Grab Sampling

- 5.6.4** Clean the grab sampler or box corer in accordance with the procedures in SOP ES-G-03 between stations.

6.0 Quality Assurance/Quality Control

- 6.1** Completing the Grab Collection Form (Attachment 1) will document that the process is being followed and that pertinent information is being collected and recorded in accordance with the procedures outlined in this SOP.
- 6.2** Entries on the forms and in the field logbook will be double-checked by the samplers to verify the information is correct. Completed forms and field logbook will be reviewed periodically by the Field Services Task Leader to verify that the requirements are being met.
- 6.3** High sediment moisture content, which can impact the achievable reporting/detection limits and sample representativeness, will be evaluated. Samples collected with a high water content will be discussed with the Field Services Task Leader to evaluate the need to collect additional sample or to take additional action that would reduce the water content (e.g., allowing the sediment slurry to settle in a bucket followed by siphoning the overlying water).
- 6.4** Data quality evaluations will be based on quality control (QC) sample results. QC samples may include field duplicates and equipment rinseate blanks; collection requirements are tabulated in the associated task order specific QAPP.
- 6.5** The task order specific QAPP lists the proper sediment sample containerization, preservation, and storage conditions required to maintain sample integrity.

7.0 Data and Records Management

- 7.1** Field notes will be kept during sampling activities in accordance with SOP ES-G-01 - Field Records.
- 7.2** Field data will be distributed to the appropriate personnel as described in the task order specific FSP.
- 7.3** Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). A field corrective action form, including reason and impact on the program, will be submitted to the Task Order Manager and Project QA Officer for approval.

8.0 Personnel Qualifications and Training

- 8.1** Individuals executing these procedures will have read and be familiar with the requirements of this SOP and the corresponding plans (e.g., APP, FSP, QAPP). Inexperienced personnel performing these activities will be initially supervised by the Field Services Task Leader or his/her designee.

Standard Operating Procedure Sediment Grab Sampling

9.0 References

USEPA 2001. Methods for Collection, Storage and Chemical Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. United States Environmental Protection Agency, Office of Water. EPA-823-B-01-002. October 2001.


10.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Standard Operating Procedure Sediment Grab Sampling

Attachment 1 Example of Grab Collection Form

Sediment Grab Collection Record



Location ID **Date** **Project**
Sampler **Contractor** **Vessel**
Weather
Sampling Equipment **Diameter in**
Target Northing **Easting** NJ NAD83 Stateplane Feet

Grab Number **Time 24hr** **Water Depth ft** **# Attempts**
Actual Northing **Easting** **Distance from target ft**
Target Penetration Depth ft **Remarks**
Actual Penetration Depth ft
Recovered Length ft
Recovery %

RPD cm **Texture all** Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
PID ppm **H2S ppm** **Color** Black Dark Gray Light Gray Brown Tan Green
Debris Yes No **Oil sheen** Yes No **Visible biology** Yes No

Grab Number **Time 24hr** **Water Depth ft** **# Attempts**
Actual Northing **Easting** **Distance from target ft**
Target Penetration Depth ft **Remarks**
Actual Penetration Depth ft
Recovered Length ft
Recovery %

RPD cm **Texture all** Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
PID ppm **H2S ppm** **Color** Black Dark Gray Light Gray Brown Tan Green
Debris Yes No **Oil sheen** Yes No **Visible biology** Yes No

Grab Number **Time 24hr** **Water Depth ft** **# Attempts**
Actual Northing **Easting** **Distance from target ft**
Target Penetration Depth ft **Remarks**
Actual Penetration Depth ft
Recovered Length ft
Recovery %

RPD cm **Texture all** Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
PID ppm **H2S ppm** **Color** Black Dark Gray Light Gray Brown Tan Green
Debris Yes No **Oil sheen** Yes No **Visible biology** Yes No

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Standard Operating Procedure Sediment Grab Sampling

Attachment 2 Equipment Rinsate Blank Collection Procedure

1. Decontaminate the sample handling equipment (e.g., grab, box corer, utensils and basins/bowls) according to the procedures detailed in SOP ES-G-03 – Equipment Decontamination.
2. Rinse the utensils with de-ionized water (DIW), collect the rinse water in the decontaminated basin/bowl, and pour it into laboratory-provided containers. Note that equipment rinsate blanks for dioxins/furans will substitute hexane for the DIW. Sample volume, container type, preservatives, and storage details are provided in the task order specific QAPP. QC sample blank containers will be pre-preserved by the laboratory that provides them. Note: equipment blanks may not be appropriate for each parameter
3. Label each container with the sample ID, date and time of collection, and the analytical parameters, cover the label with clear packing tape and fill out the custody form (refer to SOP ES-G-04 – Sample Custody).
4. Store the samples in a cooler on ice until they are transported to the field facility, under the Field Custody and Transfer Form (refer to SOP ES-G-04 – Sample Custody), for shipment to the corresponding analytical laboratory following SOP ES-G-05 – Sample Packaging and Shipping.

Standard Operating Procedure

Surface Water Sampling

Procedure Number: ES-W-01

Revision No.: 0

Revision Date: September 2017

Prepared by

Rachel MacPhee

Reviewed by:

Maura Surprenant
AECOM Deputy Program Manager

Date: _____

Debra L. Simmons
AECOM Project Quality Assurance Officer

Date: _____

Annual review of this SOP has been performed
and the SOP still reflects current practice.

Initials: _____ Date: _____

Initials: _____ Date: _____

Standard Operating Procedure Surface Water Sampling

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Standard Operating Procedure

Surface Water Sampling

1.0 Scope and Applicability

- 1.1 This project Standard Operating Procedure (SOP) defines the operating procedures for the collection of bulk and discrete water samples under the United States Army Corps of Engineers New England District (NAE) Environmental Services (ES) Program. Water samples are collected either using a bottle-type sampler, or with the aid of a peristaltic (or other equivalent) water pump.
- 1.2 Samples will be collected using a pre-cleaned peristaltic pump and CFLEX™ (or equivalent) tubing system. If needed, a Niskin bottle may be utilized. Samples may be analyzed for chemical, biological and physical analyses. Analytes and water depths for samples for a particular program are specified in the task order specific Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP).
- 1.3 It is fully expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending upon field conditions or limitations imposed by the procedure. Substantive modification to this SOP will be approved in advance by the AECOM Project QA Officer and the AECOM Task Order Manager and communicated to the client. Deviations from this SOP will be documented in the field records.

2.0 Health and Safety Considerations

- 2.1 The health and safety considerations for the work associated with this SOP, including physical, chemical, and biological hazards are addressed in the task order specific Accident Prevention Plan. The major health and safety considerations for the work are the near and on-water safety aspects of the sample collection.
- 2.2 Daily safety briefings are to be conducted at the start of each working day before any work commences. These daily briefs are to be facilitated by the Site Safety Officer (SSO) or his/her designee to discuss the day's events and any potential health risk areas covering every aspect of the work to be completed. Weather conditions are often part of these discussions. As detailed in the APP, everyone on the field team has the authority to stop work if an unsafe condition is perceived until the conditions are fully remedied to the satisfaction of the SSO.

3.0 Interferences

- 3.1 Cross-contaminations of samples may result if sample handling equipment is inadequately or improperly decontaminated.
- 3.2 Contamination of samples may result if samples are exposed to certain environmental conditions. Exposure to potential sources of contamination (e.g., exhaust fumes) will be minimized.
- 3.3 Care must be taken to avoid disturbing the bed sediment during sampling. Re-suspended bed sediments may contaminate/ artificially bias the surface water samples.
- 3.4 Inappropriate sampling equipment, such as that manufactured from non-inert plastics, may contaminate samples. Using Teflon, polymer, or stainless steel sampling equipment will minimize contamination during sample collection activities.

Standard Operating Procedure Surface Water Sampling

- 3.5 Purging of the pump system with a minimum of three volumes of site water prior to sample collection will ensure a representative sample.

4.0 Equipment and Materials

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, depending on the field conditions encountered:

- Peristaltic or equivalent water pump, variable speed
- 12-volt battery (as needed)
- CFLEX or equivalent polymer tubing (typical configuration requires 3/8 in. Inner Diameter [ID])
- Silicone tubing (typical configuration requires 1/4 in. ID) for peristaltic pump head
- Niskin or equivalent sampling bottle
- Sample containers as specified in the QAPP
- Connective (serial) cabling
- Zip ties
- Weight bearing line/cable
- Field computer (if applicable)
- Project specific field log book
- Chemical-free wipes
- Disinfectant wipes
- Approved plans, including target sampling locations
- Insulated coolers with wet ice
- Field notebook, pen, standardized forms (as needed)
- Chain-of-custody forms and seals
- Replacement batteries
- GPS
- Safety gear (APP specified PPE)
- Nitrile gloves
- Gauntlet gloves
- Storage bags
- Survey vessel fitted with differential global positioning system (DGPS) navigational equipment (SOP ES-G-02) and fathometer

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- Multi-parameter datasonde, calibrated daily according to manufacturer's instructions
- Dry storage cooler

5.0 Procedures

5.1 Water Pump/Tubing Set-up

- 5.1.1** Fasten the CFLEX™ tubing to the datasonde (YSI or equivalent) that will be used to conduct water column profiling with plastic tape if water quality parameters are needed. Avoid causing any obstruction to the turbidity sensor. Attach the datasonde and the tubing inlet to the weighted deployment line at approximately 3 feet above the anchor weight. The tubing and the sensor cable should then be fastened (with plastic tape or similar) to the weighted deployment line at regular intervals over the entire length.
- 5.1.2** Connect the pump to a 12-volt battery or directly to the vessel's 12-volt electrical system using appropriate electrical connections. The water pumps and associated tubing should be new and dedicated to the project. Water pumps should be rinsed with tap water before and after each sampling day but between-station (or between sampling depth) rinsing is not generally required for major component sampling/analysis. However, the internal volume of water carried in the system (pump inlet to pump outlet) should be purged with a least three volumes of river water prior to sample collection to ensure that a representative sample is collected. The tubing should be sealed in a bag when not in use; open tube ends should also be covered and protected when not in use, including between stations. The number of minutes required to purge the pump and tubing will be calculated as follows:

$$(((\pi r^2 \times l)/10)/f) \times 3 = \text{minutes to purge the pump}$$

Where:

π = pi

r = half the inner diameter of the tubing (centimeters)

l = length of tubing used on station (meters)

f = flow rate of the pump (liters/minute)

5.2 Field Data and Sample Collections

- 5.2.1** Navigate to sampling stations per SOP ES-G-02, Navigation/Positioning; sample locations are described in the task order specific FSP. Estimate and record the depth of the water. Water depth may be recorded using a weighted line with 0.1 ft increments marked.
- 5.2.2** Deploy the datasonde and attached sampling tube and begin water column profiling as outlined in the FSP.

At the station of interest, the datasonde (and sampling tubing) should be lowered through the water column until it is at the correct depth according to the FSP. Turbidity will be monitored real time during the descent and caution taken to avoid contact with the bottom. In the event of bottom contact during sampling, as determined by operator "feel" or sporadically high real-time turbidity readings, sampling should be delayed until the turbidity plume has dissipated.

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Water quality measurements will be recorded as required by the task order specific FSP. After completion of an initial water column profile by instrument retrieval, water collections will then be made by returning the instrument package to the desired depth.

Following the purging procedure, water sampled from the pump outlet will be collected directly into the appropriate sample containers for laboratory analysis per the task order specific FSP and QAPP. Fill each sample container while avoiding contact between the sampling tube and the bottle.

- 5.2.3 In areas and for parameters that allow grab sampling, the Niskin or equivalent sampler is lowered to the desired depth. The trigger mechanism is activated to close the sampler and the sampler is retrieved to the boat. Water from the sampler may be poured directly in the sample containers. Place the capped container on ice in a cooler.
- 5.2.4 The samples will be numbered and labeled as described in the FSP. Samples will be placed in coolers and stored on ice until shipment or transfer to the laboratory.
- 5.2.5 All discrete water samples should be collected and stored/transferred to laboratories according to the procedures described in SOP ES-G-05 - Packaging and Shipping.

6.0 Quality Assurance / Quality Control

- 6.1 It is the responsibility of the Field Services Team Leader to check the calibration information, to spot check instrument operations, and to check the documentation accuracy of all field staff.
- 6.2 Quality control (QC) samples may include equipment blanks, field and laboratory duplicates as specified in the task order specific QAPP.

6.2.1 Equipment blanks

Equipment blanks will be collected at the frequency specified in the QAPP, and from each set of sampling gear (e.g., tubing, tubing outfitted with a filter, and bottle sampler with tubing, etc.), after the sampling gear is decontaminated per SOP ES-G-03 – Equipment Decontamination.

Equipment blanks may be collected if required by the task order specific QAPP for pumped samples by flushing the collection tube with deionized water and filling a set of containers with deionized water that has been pumped through the system.

If required, bottle blanks may be used to evaluate potential contamination associated with the direct grab sampling technique. In this case, bottles may be filled directly with deionized, capped, bagged, and stored on ice for transfer to the laboratory.

7.0 Data and Records Management

- 7.1 Field notes will be kept during coring activities in accordance with SOP ES-G-01 – Field Records. The information pertinent to coring activities includes chronology of events, sample locations (x,y,z), time/date, sampler name, methods, sampler penetration and acceptability, sample observations, and the times and type of equipment decontamination. This information will be recorded in the field logbook.

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- 7.2 Field data will be distributed to the appropriate personnel as described in the task order specific QAPP and FSP.
- 7.3 Deviations to the procedures detailed in the SOP will be recorded in the field logbook at the time of occurrence and reported on the Daily Activity Log (refer to SOP ES-G-01 – Field Records). Proposed modifications to this SOP will be recorded on a Field Corrective Action Form (refer to SOP ES-G-01 – Field Records), including reason and impact on the program, and will be submitted to the AECOM Task Order Manager for approval.

All records associated with the activities described in this SOP will be ultimately maintained in accordance with the task order specific QAPP.

8.0 Personnel Qualifications and Training

Individuals executing these procedures will have read and be familiar with the requirements of this SOP and the corresponding project plans (e.g., APP, FSP, and QAPP). Inexperienced personnel performing these activities will be initially supervised by the Field Services Task Leader or his/her designee. Surface water sampling procedures are relatively simple and can be implemented by personnel without specialized training. However, it is recommended that initial sampling activities be supervised by more experienced personnel.

9.0 Revision History

Revision	Date	Changes
0	September 2017	NA

Appendix B

RIM QC Summary Tables

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	
3. If not, were deviations documented?	
4. Was the SAP approved by the New England District?	
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	
7. Were the correct stations sampled (include the precision of the navigation method used)?	
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	
9. Were the samples properly labeled?	
10. Were all the requested data included?	
11. Were the reporting limits met?	
12. Were the chain-of-custody forms properly processed?	
13. Were the method blanks run and were the concentration below the acceptance criteria?	
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	
15. Were the SRM/CRM analyses within acceptance criteria?	

Table II-1 (continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	
19. Were surrogate recoveries within the required acceptance criteria?	
20. Were corrective action forms provided for all non-conforming data?	
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	

Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270C

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package

Table II-2 (continued): Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270C

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-3: Quality Control Summary for Analyses of Pesticides in Sediment, Tissue and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (< 20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package

Table II-3 (continued): Quality Control Summary for Analyses of Pesticides in Sediment, Tissue and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB congeners) in Sediment, Tissue and Water Matrices

Method Reference Number: 8082A

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration. (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package

Table II-4 (continued): Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB congeners) in Sediment, Tissue and Water Matrices

Method Reference Number: 8082A

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly			Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery			Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package

Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)			In Data Package
--------------------------------	--	--	--	-----------------

Table II-5 (continued): Quality Control Summary for Analyses of Metals in Sediments, Tissue and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample. (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package

Table II-6 (continued): Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	≤ 10% mean ≤ 30% mussel/oyster; ≤ 40% clam larvae, ≤ 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	≤ 10% mean (no chamber > 20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

AECOM

Appendix B: Field Report

USACE CONTRACT NO. W912WJ-17-D-0003
Delivery Order No. W912WJ18F0109

Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project: Field Report

New Haven Harbor Navigation Improvement Project, New Haven Connecticut

Prepared for



U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

Prepared by
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project: Field Report

New Haven Harbor Navigation Improvement Project, New Haven Connecticut

Prepared By:



Kris van Naerssen
AECOM Task Order Manager / Chief
Scientist / Site Safety Officer

11/02/2018

Date

Reviewed By:



Maura Surprenant
AECOM Deputy Program Manager

11/02/2018

Date

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Attachments

- Attachment 1 New Haven Harbor / CLDS Sampling Daily Activity Logs
- Attachment 2 New Haven Harbor / CLDS SH&E Documentation
- Attachment 3 New Haven Harbor / CLDS Chain of Custody Forms
- Attachment 4 New Haven Harbor / CLDS Field Logs

Acronyms

Alpha	Alpha Analytical Laboratories
°C	degrees Celsius
CLDS	Central Long Island Sound Disposal Site
COC	Chain of Custody
DGPS	Differential Global Positioning System
ESI	EnviroSystems, Inc.
FSP	Field Sampling Plan
FNP	Federal Navigation Project
L	liter
NAE	New England District
NOAA	National Oceanographic and Atmospheric Administration
OSI	Ocean Surveys, Inc.
R/V	Research Vessel
QAPP	Quality Assurance Project Plan
SPP	Suspended Particulate Phase
USACE	United States Army Corps of Engineers

1. Introduction

The New Haven Harbor dredged material suitability determination field program was completed by both U.S. Army Corps of Engineers (USACE), New England District (NAE) personnel (harbor site sampling) and individuals on the AECOM and Ocean Surveys Inc. (OSI) Field Team (collectively the AECOM Field Team). Field activities undertaken by the AECOM Field Team included collection and transport of sediment and water samples from the Central Long Island Sound Disposal Site (CLDS) Reference Site, as well as receipt and delivery of NAE-collected representative sediment and water samples from proposed maintenance and improvement dredging areas within the New Haven Harbor Federal Navigation Project (FNP).

Tasks described within this Field Report focus primarily on activities undertaken by the AECOM Field Team. Sampling techniques employed by NAE personnel, relative to sediment and water collection activities within New Haven Harbor, are addressed under separate cover.

2. New Haven Harbor / CLDS Reference Site Sampling Field Summary

The project field effort commenced on October 22, 2018 and was completed on October 26, 2018. The AECOM Field Team program was divided into four subtasks:

- The AECOM Field Team's collection of sediment and water samples at the CLDS Reference Site on October 23, 2018;
- AECOM's receipt of New Haven Harbor sediment and water samples which were collected by NAE (samples collected by NAE on October 22 through 25, 2018) and received by AECOM on October 23 through 25, 2018;
- AECOM's delivery of samples to the project toxicology laboratory, EnviroSystems, Inc. (ESI) on October 24, 2018 and two deliveries to ESI on October 25, 2018; and,
- AECOM's delivery of samples directly to the project chemistry laboratory, Alpha Analytical, Inc. (Alpha) or to the Alpha courier on October 24 and 25, 2018.

CLDS Reference Site samples (sediment/water) were collected by the AECOM Field Team from OSI's sampling platform, the survey vessel R/V Willing II. Table 1 summarizes the activities accomplished during the field effort. Daily Activity Logs are provided in Attachment 1.

3. Health and Safety

The New Haven Harbor dredged material suitability determination efforts and the associated CLDS sampling activities were completed safely and without incident. AECOM Team participants took an active part during the daily project safety briefings. The AECOM Deputy Program Manager and the USACE Task Order Manager were notified at the completion of the on-water field activities. Documentation of the daily safety briefings is included in Attachment 2. The Float Plan and Tailgate meeting forms covering boating activities and task order safety protocols are included in Attachment 2.

4. Sediment Collection

New Haven Harbor sediments were collected by NAE using vibracore methodology. NAE collected vibrocore samples from thirteen representative harbor locations to be composited into six composites, as detailed in Table A-1 of the Project Work Plan¹. These NAE-collected sediment samples were containerized by NAE and transferred to AECOM under chain of custody (COC) during, and at the conclusion of, the USACE sampling efforts.

CLDS Reference Site sediments were collected by the AECOM Field Team using a modified Van Veen grab sampler as outlined in, and in accordance with, the Project Work Plan.

¹ AECOM, 2018. *Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project: Project Work Plan - New Haven Harbor Navigation Improvement Project New Haven, Connecticut* USACE Contract No. W912WJ-17-D-003. Delivery Order No. W912WJ18F0109. October, 2018. The Project Work Plan is comprised of the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP).

New Haven Harbor samples and the CLDS Reference Site samples were held in a temperature-controlled refrigerated truck unit in accordance with the project Work Plan until delivery to ESI and/or Alpha.

4.1 Vessel Positioning

Vessel positioning was accomplished utilizing a Differential Global Positioning System (DGPS) unit and associated Hypack vessel positioning software. The local National Oceanic and Atmospheric Administration (NOAA) tide data were obtained from the appropriate local stations.

4.2 Grab Sample Handling

Grab sampling at the CLDS Reference Site was accomplished as outlined in the Work Plan, using a modified Van Veen grab sampler. Multiple deployments of the grab sampler were required to obtain the minimum volume of reference site sediments required for testing (18-gallons). For each grab, the sample was examined, key features were recorded and the sample was transferred with stainless steel spoons into food-grade polyethylene buckets. These samples were placed on ice for preservation until return to the dock.

The buckets of sediment collected at the reference site were transferred from the vessel and placed into a locked refrigerated truck set to 2.2 degrees Celsius (°C) upon return to the dock. These sediment samples were transported under COC and signed over to the biological laboratory, as detailed in Table 1.

Before and after sediment collection, the sampling gear was decontaminated as outlined in the Project Work Plan.

5. Water Collection

Water samples from the harbor area (site water) were collected by NAE from representative harbor locations on October 24, 2018, and composited into six samples as detailed in Table A-1 of the Work Plan. These water samples were transferred to AECOM under COC during the NAE field sampling efforts.

Water from the CLDS reference site was collected by the AECOM Team on 23 October, 2018 for chemical analysis and for use as SPP dilution water.

The CLDS reference site water samples were collected using a large volume Niskin bottle system as described in the Work Plan. The reference site water samples were collected from mid-depth in the water column. The seawater was transferred directly into new 5-gallon plastic cubitainers and into Alpha-supplied sample bottles. These samples were placed on ice for preservation until return to the dock.

Water samples collected by the AECOM Field Team were transferred to the refrigerated truck upon return to the dock.

Before and after water collection, the sampling gear was decontaminated as outlined in the Work Plan.

6. Field QA/QC Procedures

Equipment blanks were collected (by USACE personnel) on October 24, 2018 from the field sampling equipment used by NAE in New Haven Harbor (i.e. the core sampler and pump and tubing system). Equipment blanks were collected (by the AECOM Field Team) on October 23, 2018 from the field sampling equipment used by the AECOM Field Team (sediment and water grab samplers) for the CLDS Reference Site sampling.

Equipment blanks were iced for transport to the dock, and transferred to the locked refrigerated truck upon return to the dock. All samples were held under COC, and signed for during ownership transfer (Attachment 3).

7. Difficulties Encountered

There are two notes of interest relative to the New Haven Harbor / CLDS field sample collection effort:

- During the CLDS Reference Site field sampling operations, sea conditions picked up with larger wave action than was forecast for the day (i.e. approx.. 4' seas intermittently). During the water sample collection efforts,

the captain and AECOM Field Team determined that it was unsafe and inadvisable to attempt to fill the laboratory glassware with CLDS waters while offshore, due to the wave action. All of the equipment blanks and large volume cube containers had been filled with reference site waters when this decision was made. The CLDS Reference Site laboratory waters which were collected while at sea, were temporarily containerized in spare large volume cube containers and subsequently transported back to the dock for final containerization into the laboratory-provided glassware. No project work plan deviations were incurred as a result of this change, which was made for Health and Safety reasons. No associated project implications are anticipated.

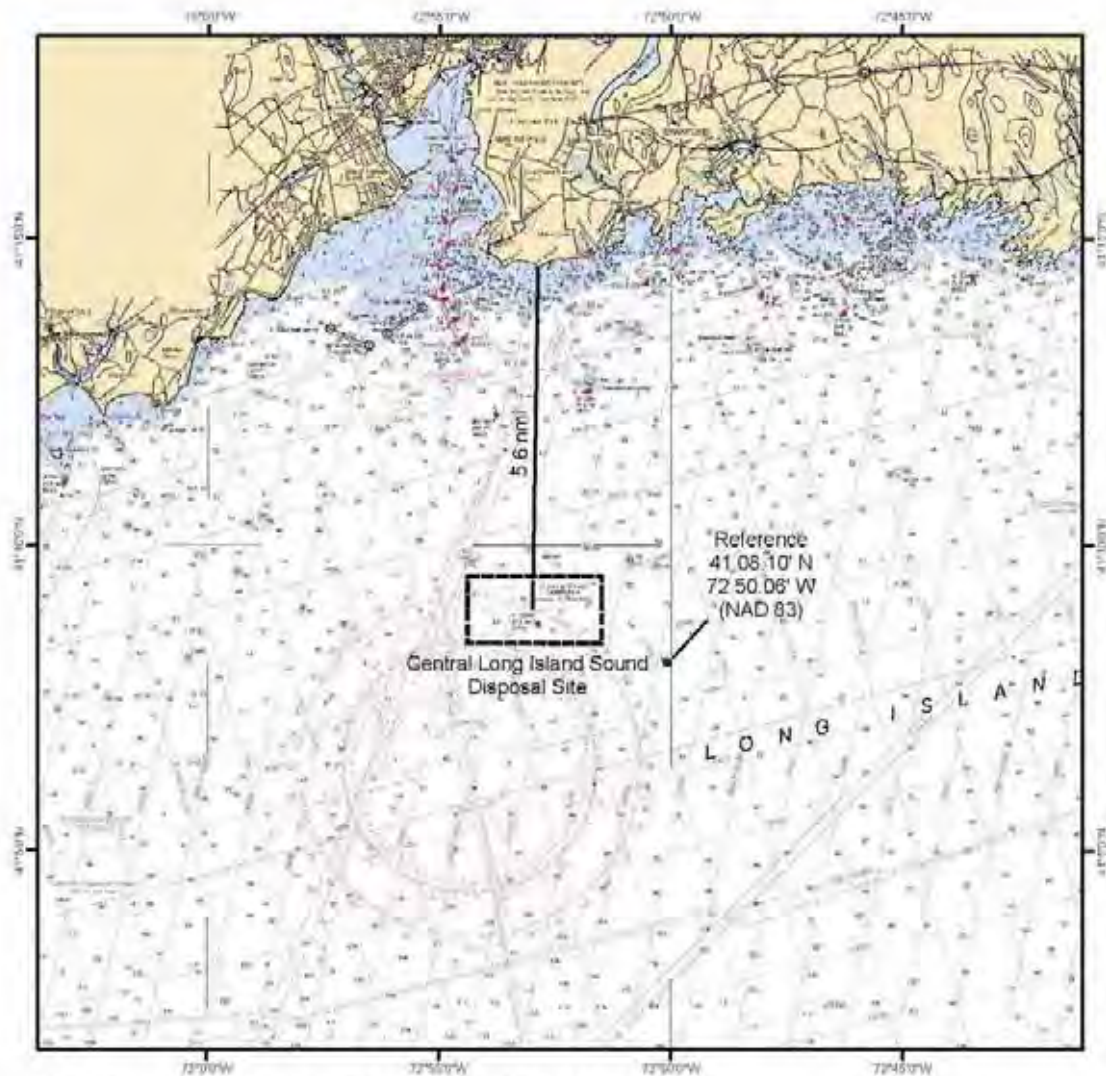
- The Project Work Plan indicates that *“Samples will be chilled on wet ice while on board the vessel and subsequently transferred to a refrigerated box truck/van daily during field operations. The temperature in the refrigerated vehicle will be regularly monitored to ensure that the storage temperature is maintained at 4° Celsius (C) ±2° C”*. During sample transport, AECOM continuously monitored the conditions within the refrigerated van unit as prescribed. In addition, and as a precaution against the potential of malfunctioning refrigeration equipment, AECOM packed the samples with wet-ice during the sample transport to the project toxicology laboratory. During two discrete periods (approximately 20 minutes prior to sample delivery at the project toxicology laboratory on 25-October-18; and again later that same day), the AECOM transport driver noticed an intermittent malfunction of the refrigerated van’s compressor unit. Upon investigation, the driver determined that the refrigeration compressor was displaying an error code and subsequently notified the AECOM Project Manager, the refrigerated van provider and the NAE Task Manager. Throughout the sample transport operations, and upon sample check-ins at the project toxicology laboratory, AECOM confirmed that cargo area holding temperatures were within or below the work plan prescribed temperature range. Accordingly, and as the samples were also transported on ice, no Project Work Plan “deviation” is noted here. Additional details regarding temperatures within the refrigerated van are presented in Attachment 4.

Project logbook entries and grab sample logs are included in Attachment 4. Neither of the above items represented a deviation from the approved work plan. As such no corrective action forms have been prepared.

Table 1 New Haven Harbor / CLDS Field Survey Activity Summary

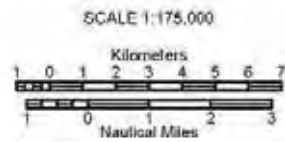
Date	AECOM Field Activities	Equipment	Platform
October 22, 2018	Project Mobilization. NAE Field Sampling coordination, AECOM on stand-by.	Refrigerated Truck	Refrigerated Truck
October 23, 2018	CLDS Reference Site water and sediment grab sampling. Equipment blank collection (for CLDS sampling equipment).	Van Veen Grab Sampler, Niskin Bottle, Refrigerated Truck	R/V Willing II Refrigerated Truck
	New Haven Harbor sediment receipt from NAE and subsequent storage/transport to ESI and Alpha Analytical	Refrigerated Truck	Refrigerated Truck
October 24, 2018	CLDS and New Haven Harbor sample transport to ESI	Refrigerated Truck	Refrigerated Truck
	Analytical sample transfer to Alpha Analytical	Lab supplied cooler	Lab courier
	New Haven Harbor sediment and water sample receipt from NAE. Subsequent storage/transport to ESI and Alpha Analytical	Refrigerated Truck	Refrigerated Truck
October 25, 2018	New Haven Harbor sediment water sample receipt from NAE and subsequent storage/transport to ESI and Alpha Analytical	Refrigerated Truck	Refrigerated Truck
	Analytical sample transfer to Alpha Analytical	Lab supplied cooler	Lab courier
October 26, 2018	Project Demobilization	Refrigerated Truck	Refrigerated Truck

Figure 1 CLDS Reference Site Sediment and Water Sampling Location – New Haven Harbor Sediment Characterization Study (Figure from PWS, NAE 2018)



CENTRAL LONG ISLAND SOUND DISPOSAL SITE

Description: The Central Long Island Sound Disposal Site (CLDS) is one of four regional dredged material disposal sites located in the waters of Long Island Sound. CLDS covers a 11.04 km² (3.2 nm²) area and is centered at 41° 08.950' N, 72° 52.950' W (NAD 83). It is located approximately 10.89 km (5.8 nmi) south of South End Point, East Haven, Connecticut. Since 1977, the management strategy at CLDS has entailed the controlled placement of small to moderate volumes of sediment to form individual disposal mounds on the seafloor. The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents.



(NOTE: This cross is not intended for use in navigation)



Figure 2 New Haven Harbor FNP – NAE Sediment and Water Sampling Location (Figure from PWS, NAE 2018)



Attachment 1 New Haven Harbor / CLDS Sampling Daily Activity Logs

Daily Activity Log

New Haven Harbor Supplemental Evaluations
Reference Site Sampling and Sample Transport

USACE Contract No. W912WJ-17-D-0003
Delivery Order No. W912WJ-18-F-0109

Date: 10/23/18

Vessel/Sampling Platform:

R/V Willing II, REFRIGERATED TRUCK

Personnel (Name/Affiliation/Role):

K. VAN NAERSSON / AECOM / FIELD SCIENTIST/SSOTIOM

K. CADMUS / OSI / CAPTAIN

M. BARRITT / OSI / MATE

C. NIXON / AECOM / TRANSPORT DRIVER

Sampling Performed/Equipment Used:

CLDS Sampling by AECOM TEAM (MODIFIED VAN VEEN SAMPLER + NISKIN BOTTLE)

NMH SEDIMENT + WATER SAMPLES BY NAC (SEE COCS FOR SAMPLE IDs), VIBROCORE SAMPLING

Stations Sampled:

CLDS REFERENCE SITE SAMPLED BY AECOM

NEW HAVEN HARBOR STATIONS - SEE ACCOMPANYING COCS

Health and Safety Issues:

NONE NOTED (LARGER WAVES/WINDS THAN PREDICTED)

Deviations from Approved Plan:

NONE NOTED, TWO ITEMS OF NOTE:

- CLDS ~~EQUIPMENT~~ ^{Reference Site Wherry} ~~BEING~~ SAMPLES COLLECTED

AT REF. SITE, BUT CONTAINED IN LAB GLASS W/ AT DOCK

HIGH SPAC/SHE CONCERNS. NO PROTECT IMPLEMENTATION

- REEFER TRUCK EXCHANGED BY RENTAL COMPANY PRIOR

Dock Departure Time: 09:00

SAMPLE STORAGE, TO CORRECT A

Dock Return Time: 16:05

ISSUE - NO PROTECT IMPLEMENTATION

Recorded by: K. VAN NAERSSON, AECOM

DUE TO ANTICIPATED HIGH SPAC/SHE CONCERNS. NO PROTECT IMPLEMENTATION. COMPRESSIVE ANTICIPATED.

Daily Activity LogNew Haven Harbor Supplemental Evaluations
Reference Site Sampling and Sample TransportUSACE Contract No. W912WJ-17-D-0003
Delivery Order No. W912WJ-18-F-0109

Date: 10/24/18

Vessel/Sampling Platform: REFRIGERATED TRUCK

Personnel (Name/Affiliation/Role):

C. NIXON / AECOM / TRANSPORT DRIVER

Sampling Performed/Equipment Used:

NEW HAVEN HARBOR SEDIMENT + WATER
SAMPLING BY NAE (VIBRO CORES + PUMP &
TUBING SAMPLING)

Stations Sampled:

NEW HAVEN HARBOR STATIONS -
SEE ACCOMPANYING COCS

Health and Safety Issues:

NONE NOTED

Deviations from Approved Plan:

NONE NOTED

Dock Departure Time: N/A

Dock Return Time: N/A

Recorded by: K. VAN NABESSON, AECOM 

Daily Activity Log

New Haven Harbor Supplemental Evaluations
Reference Site Sampling and Sample Transport

USACE Contract No. W912WJ-17-D-0003
Delivery Order No. W912WJ-18-F-0109

Date: 10/25/18

Vessel/Sampling Platform:

REFRIGERATED TRUCK

Personnel (Name/Affiliation/Role):

C. NIXON / AECOM / TRANSPORT DRIVER

Sampling Performed/Equipment Used:

NEW HAVEN HARBOR SEDIMENT SAMPLING
BY NAB (VIBROCORE SAMPLING)

Stations Sampled:

NEW HAVEN HARBOR STATIONS -
SEE ACCOMPANYING CDCS

Health and Safety Issues:

NONE NOTED

Deviations from Approved Plan:

NONE NOTED - REFRIGERATED TRUCK / COMPRESSOR
ISSUES NOTED, SEE ACCOMPANYING LOG-BOOK +
FIELD REPORT. TEMPS MAINTAINED AT OR BELOW
WORK PLAN SPECIFIED RANGE - NO

Dock Departure Time: N/A


PROJECT IMPLICATIONS ANTICIPATED

Dock Return Time: N/A

Recorded by: K. VAN NORDEN, AECOM

Attachment 2 New Haven Harbor / CLDS SH&E Documentation

Daily Float Plan

Name of vessel's operator:		KEN CADMUS	
Telephone Number:		860-395-8112	
Name of Vessel:		EPR/Willing II	
Registration No.:		CT 2716 AM	
Description of Vessel:		Cabin Survey (see App for specs)	
Type:		27'	
Make:		WHITE	
Color of Hull/Trim:		PORT SIDE DAUNT	
Most distinguishing identifiable feature:			
Rafts/Dinghies: Number: 0		Size: — Color: N/A	
Radio: Type: UHF		Frequencies Monitored: 16, 13	
Number of persons onboard: 3			
Name:		Age:	Address & Telephone:
Kris van Norkssen		39	NORTHAMPTON, MA 484-678-1876
Ken Cadmus		46	PAWCATUCK, CT 860-395-8112
MORGAN BARRETT		49	WESTBROOK, CT 860-277-1355
Engine Type: YAMAHA H.P.: 2X Normal Fuel Supply (days): 1+			
OUTBOARD 150HP			
Survival equipment on board: (check as appropriate)			
<input checked="" type="checkbox"/> Life Jackets	<input checked="" type="checkbox"/> Flares	<input checked="" type="checkbox"/> Smoke Signals	
<input checked="" type="checkbox"/> Medical Kit	<input type="checkbox"/> EPIRB	<input type="checkbox"/> Paddles	
<input checked="" type="checkbox"/> Anchor	<input checked="" type="checkbox"/> Loran/GPS	<input checked="" type="checkbox"/> Life Ring	
Trip: CLOS SAMPLING			
Date & Time of Departure: 10/23/18 09:00			
Departure From: BRANFORD R. BOAT LAUNCH		Departure To: SAME	
Expected to arrive by: 14:00 In no case later than: 17:00			
Date & Time of Arrival: 10/23/18 16:05		Boat Lead Signature at Arrival: 	



Boat Safety Checklist

Date: 10/23/18

Keep this page with your boat, ready for inspection. By using this checklist, or one fine-tuned by yourself, you'll be sure that everything is on board and in good working order. Your passengers will appreciate knowing you're concerned about boating safety.

- Float plan: let someone landside know when you're leaving, where you're going, when you expect to return, what to do if you don't, and a description of your boat
- Registration certificate or documentation
- Personal Flotation Devices (wearable and throwable): USCG approved, good condition, readily accessible, assigned and fitted
- Fire Extinguishers: right number, size, and class for boat; charged, not corroded, nozzle clear, bracketed, readily accessible
- Visual Distress Signals: current dates on flares, proper number, batteries good if lights or EF
- Anchors and Line: adequate anchor for bottom, adequate line for water depth
- Bilge device: bilge pump operable, alternative bailing device available
- Watch or clock: operable
- Bright flashlight or searchlight
- Navigation lights: tested and operable, spare bulbs
- Batteries: fully charged, encased in plastic boxes or terminals covered, securely fastened to
- Sound-producing device: horn, whistle appropriate for boat
- Alternate propulsion: paddle or oar
- First Aid Kit
- Tools, spare outboard prop and lock nut
- Compass
- Sunscreen
- Weather Radio

Vessel: Willow IICaptain: KEW CADMUSCaptain's Signature: [Signature]

Americas

Behavior Based Safety Checklist

S3AM-007-FM1

Use comment column when unsafe behavior / conditions were observed. Describe what was observed and why this occurred.

Job Location: New Haven Harbor Date: 10/23/18

Task/Work Observed: Loading sample into van Observer: CJ Nixon

	<u>Safe</u>	<u>Unsafe</u>	<u>Comments</u>
Personal Protective Equipment			
Head	<input type="checkbox"/>	<input type="checkbox"/>	
Hand	<input type="checkbox"/>	<input type="checkbox"/>	
Feet	<input type="checkbox"/>	<input type="checkbox"/>	
Eyes/Face	<input type="checkbox"/>	<input type="checkbox"/>	
Skin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Hearing	<input type="checkbox"/>	<input type="checkbox"/>	
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment / Tools			
Proper tool for the job	<input type="checkbox"/>	<input type="checkbox"/>	
Condition	<input type="checkbox"/>	<input type="checkbox"/>	
Proper Use	<input type="checkbox"/>	<input type="checkbox"/>	
Body Use / Position			
Lifting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Safe lifting of buckets/cubainers</u>
Pinch Point	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ladder / stairs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Hand placement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Travel path / speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Body position	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Work Practices			
Follow Safety Plan / Procedures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Housekeeping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other			
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

Americas

Behavior Based Safety Checklist

S3AM-007-FM1

Use comment column when unsafe behavior / conditions were observed. Describe what was observed and why this occurred.

Job Location: New Haven Harbor Date: 10/24/18

Task/Work Observed: loading samples Observer: CJ Wilson

	<u>Safe</u>	<u>Unsafe</u>	<u>Comments</u>
Personal Protective Equipment			
Head	<input type="checkbox"/>	<input type="checkbox"/>	
Hand	<input type="checkbox"/>	<input type="checkbox"/>	
Feet	<input type="checkbox"/>	<input type="checkbox"/>	
Eyes/Face	<input type="checkbox"/>	<input type="checkbox"/>	
Skin	<input type="checkbox"/>	<input type="checkbox"/>	
Hearing	<input type="checkbox"/>	<input type="checkbox"/>	
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment / Tools			
Proper tool for the job	<input type="checkbox"/>	<input type="checkbox"/>	
Condition	<input type="checkbox"/>	<input type="checkbox"/>	
Proper Use	<input type="checkbox"/>	<input type="checkbox"/>	
Body Use / Position			
Lifting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Safe lifting</u>
Pinch Point	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Doors of van covered open</u>
Ladder / stairs	<input type="checkbox"/>	<input type="checkbox"/>	
Hand placement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Hands on handles</u>
Travel path / speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Travel path kept clear</u>
Body position	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Safe lifting movements</u>
Work Practices			
Follow Safety Plan / Procedures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Housekeeping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other			
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

Americas

Behavior Based Safety Checklist

S3AM-007-FM1

Use comment column when unsafe behavior / conditions were observed. Describe what was observed and why this occurred.

Job Location: Hampton, NH Date: 10/25/18

Task/Work Observed: Unloading samples Observer: CJ N. 200

	<u>Safe</u>	<u>Unsafe</u>	<u>Comments</u>
Personal Protective Equipment			
Head	<input type="checkbox"/>	<input type="checkbox"/>	
Hand	<input type="checkbox"/>	<input type="checkbox"/>	
Feet	<input type="checkbox"/>	<input type="checkbox"/>	
Eyes/Face	<input type="checkbox"/>	<input type="checkbox"/>	
Skin	<input type="checkbox"/>	<input type="checkbox"/>	
Hearing	<input type="checkbox"/>	<input type="checkbox"/>	
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment / Tools			
Proper tool for the job	<input type="checkbox"/>	<input type="checkbox"/>	
Condition	<input type="checkbox"/>	<input type="checkbox"/>	
Proper Use	<input type="checkbox"/>	<input type="checkbox"/>	
Body Use / Position			
Lifting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Safe lifting</u>
Pinch Point	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Doors of van/building secured open</u>
Ladder / stairs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Stairs in lab marked</u>
Hand placement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>hands on handles</u>
Travel path / speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>travel path clear</u>
Body position	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Safe lifting positions</u>
Work Practices			
Follow Safety Plan / Procedures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Housekeeping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other			
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

Americas

(US – CAN) Pre- OR Post-Trip Inspection

S3AM-320-FM2

Commercial Motor Vehicle (CMV) Inspection							
Pre-Trip Safety Inspection <input checked="" type="checkbox"/>			Post-Trip Safety Inspection <input type="checkbox"/>				
(Checklist to be completed by driver prior to operation of CMV and at the end of each shift and/or change in drivers.)							
Office / Project Name		New Haven Harbor Sampling		Project / Location #			
Driver's Full Name (printed)		License #	State / Prov.	Date: Time of Inspection			
Charles I Nixon, Jr		240392905	CT	10/23/18 1230			
Power Unit/CMV	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Mercedes Sprinter	34173 ML	NY	4/30/20				
Type of Trailer	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Insurance Provider	Policy #	State / Prov.	Exp. Date	Provider Contact Information			
INSPECTION ITEMS				N/A	YES	NO	DATE CORRECTED
Has this equipment been properly inspected by a CMV competent person and ensured to be in a safe operating condition?					✓		
Are seat belts readily available and operational? Is the horn in working condition?					✓		
Is the overall body condition of the vehicle satisfactory? Properly placarded?					✓		
Is the steering mechanism operational? Are instrument lights fully functional?					✓		
Are all required mirrors present, clean, and adjusted for the CMV operator?					✓		
Do tires meet manufacturer's operational criteria (pressure, tread, spare, etc.)?					✓		
Are back-up alarms installed as required and operational?					✓		
Are service brakes, including trailer brake connections, and parking (hand) brake functional?					✓		
Are turn signals visible and operational?					✓		
Are headlights (low/high beam) operational?					✓		
Are brake lights, tail lights and back-up lights visible and operable?					✓		
Is all cab glass intact and free of distortion? Are wipers, including wiper fluid, operational? As applicable, is an ice scraper available?					✓		
Have all fluids been checked and comply with operations manual criteria?					✓		
Is there a functional fire extinguisher and stocked first aid kit accessible?				✓			
Are there at least three stopped vehicle reflective triangles and a reflective vest?				✓			
If load lines/straps are in use have they been inspected?					✓		
a. Used in accordance with manufacturer's operational guidelines and with regulatory cargo securement requirements?					✓		
b. Rated and approved for this type of load?				✓			
Have all coupling devices been inspected and secured?				✓			
Is the vehicle equipped with the appropriate equipment (e.g. wheel wrench, jack, tire chains)?					✓		
Does the engine and exhaust system appear to be functioning properly?					✓		
Is applicable documentation valid, current and immediately accessible (e.g. insurance, registration, driver medical certificate, CDL, shipping documents, etc.)?					✓		
Driver's Signature/		Inspection Date:		10/23/18			

Americas

(US – CAN) Cargo Inspection

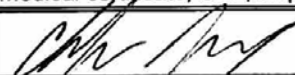
S3AM-320-FM3

Commercial Motor Vehicle (CMV) Cargo Inspection Checklist <i>(The cargo inspection checklist items 1-4 are to be completed by the CMV employee prior to CMV operation.)</i>							
Office/ Project Name		New Haven Harbor		Project/ Location Number			
				605 88790			
Driver's Full Name (Printed)		License Number		State / Prov	dd/mm/yyyy		
Charles Nixon		Z48392985		CT	10/23/18		
Power Unit/CMV	License Number	State / Prov	Expiration	Registration/Certification	Expiration		
Mercedes	34169 ML	NY	4/30/20				
Type of Trailer	License Number	State / Prov	Expiration	Registration/Certification	Expiration		
INSPECTION ITEMS					N/A	YES	NO
1. Cargo is loaded and secured to prevent:							
a. Loss of load							
b. Leaking						✓	
c. Spilling							
d. Blowing off							
e. Falling							
2. Cargo is immobilized or secured to prevent shifting upon or within the vehicle to such an extent that the vehicle's stability or maneuverability is not adversely affected.						✓	
3. The following are secure:							
a. Tailgate							
b. Tailboard							
c. Doors						✓	
d. Tarpaulins							
e. Spare tire							
f. Any other devices used to secure the cargo/load							
4. The cargo or any other object does not:							
a. Obscure the driver's view ahead or to the right or left					✓		
b. Interfere with the free movement of the driver's arms or legs							
c. Prevent ready access to accessories required for emergencies							
d. Prevent the free and ready exit of any person from the CMV							
5. Inspect and resecure as necessary the cargo and the devices used to secure the cargo within the first 50 miles (80km) after beginning a trip.					✓		
6. Re-examine and resecure the cargo:							
a. When the driver makes a change of duty status							
b. The CMV has been driven for 3 hours or 150 miles (240km) (whichever comes first)							
c. These inspection requirements do not apply:						✓	
i. If the container/trailer is sealed and the driver has been provided written direction not to open it to inspect the cargo							
ii. The cargo has been loaded in a manner that makes inspection of its cargo impracticable							

Americas

(US – CAN) Pre- OR Post-Trip Inspection

S3AM-320-FM2

Commercial Motor Vehicle (CMV) Inspection							
Pre-Trip Safety Inspection <input type="checkbox"/>			Post-Trip Safety Inspection <input type="checkbox"/>				
(Checklist to be completed by driver prior to operation of CMV and at the end of each shift and/or change in drivers.)							
Office / Project Name		New Haven Harbor sampling		Project / Location # 60580790			
Driver's Full Name (printed)		License #	State / Prov.	Date: Time of Inspection			
Charles Nixon		240392985	CT	10/24/18 0530			
Power Unit/CMV	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Mercedes Sprinter	34169 ML	NY	4/30/20		4/30/20		
Type of Trailer	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Insurance Provider	Policy #	State / Prov.	Exp. Date	Provider Contact Information			
Republic-Franklin	5067126	NY					
INSPECTION ITEMS				N/A	YES	NO	DATE CORRECTED
Has this equipment been properly inspected by a CMV competent person and ensured to be in a safe operating condition?					✓		
Are seat belts readily available and operational? Is the horn in working condition?					✓		
Is the overall body condition of the vehicle satisfactory? Properly placarded?					✓		
Is the steering mechanism operational? Are instrument lights fully functional?					✓		
Are all required mirrors present, clean, and adjusted for the CMV operator?					✓		
Do tires meet manufacturer's operational criteria (pressure, tread, spare, etc.)?					✓		
Are back-up alarms installed as required and operational?				✓			
Are service brakes, including trailer brake connections, and parking (hand) brake functional?					✓		
Are turn signals visible and operational?					✓		
Are headlights (low/high beam) operational?					✓		
Are brake lights, tail lights and back-up lights visible and operable?					✓		
Is all cab glass intact and free of distortion? Are wipers, including wiper fluid, operational? As applicable, is an ice scraper available?					✓		
Have all fluids been checked and comply with operations manual criteria?					✓		
Is there a functional fire extinguisher and stocked first aid kit accessible?				✓	✓		
Are there at least three stopped vehicle reflective triangles and a reflective vest?				✓	✓		
If load lines/straps are in use have they been inspected?							
a. Used in accordance with manufacturer's operational guidelines and with regulatory cargo securement requirements?				✓			
b. Rated and approved for this type of load?				✓			
Have all coupling devices been inspected and secured?				✓			
Is the vehicle equipped with the appropriate equipment (e.g. wheel wrench, jack, tire chains)?					✓		
Does the engine and exhaust system appear to be functioning properly?				✓			
Is applicable documentation valid, current and immediately accessible (e.g. insurance, registration, driver medical certificate, CDL, shipping documents, etc.)?				✓			
Driver's Signature/Inspection Date:		 10/24/18					

Americas

(US – CAN) Cargo Inspection

S3AM-320-FM3

Commercial Motor Vehicle (CMV) Cargo Inspection Checklist						
(The cargo inspection checklist items 1-4 are to be completed by the CMV employee prior to CMV operation.)						
Office/ Project Name	New Haven Harbor Sampling		Project/ Location Number	60588790		
Driver's Full Name (Printed)	License Number	State / Prov	dd/mm/yyyy	xx:xx am/pm		
Charles N. Xcom	248392985	CT	10/24/18	09:06:30		
Power Unit/CMV	License Number	State / Prov	Expiration	Registration/Certification	Expiration	
Mercedes Sprinter	34169 ML	NY	4/30/20			
Type of Trailer	License Number	State / Prov	Expiration	Registration/Certification	Expiration	
INSPECTION ITEMS				N/A	YES	NO
1. Cargo is loaded and secured to prevent:						
a. Loss of load						
b. Leaking					✓	
c. Spilling						
d. Blowing off						
e. Falling						
2. Cargo is immobilized or secured to prevent shifting upon or within the vehicle to such an extent that the vehicle's stability or maneuverability is not adversely affected.					✓	
3. The following are secure:						
a. Tailgate					✓	
b. Tailboard						
c. Doors						
d. Tarpaulins						
e. Spare tire						
f. Any other devices used to secure the cargo/load						
4. The cargo or any other object does not:						
a. Obscure the driver's view ahead or to the right or left				✓		
b. Interfere with the free movement of the driver's arms or legs						
c. Prevent ready access to accessories required for emergencies						
d. Prevent the free and ready exit of any person from the CMV						
5. Inspect and resecure as necessary the cargo and the devices used to secure the cargo within the first 50 miles (80km) after beginning a trip.					✓	
6. Re-examine and resecure the cargo:						
a. When the driver makes a change of duty status						
b. The CMV has been driven for 3 hours or 150 miles (240km) (whichever comes first)						
c. These inspection requirements do not apply:					✓	
i. If the container/trailer is sealed and the driver has been provided written direction not to open it to inspect the cargo						
ii. The cargo has been loaded in a manner that makes inspection of its cargo impracticable						

Americas

(US – CAN) Pre- OR Post-Trip Inspection

S3AM-320-FM2

Commercial Motor Vehicle (CMV) Inspection							
Pre-Trip Safety Inspection <input checked="" type="checkbox"/>			Post-Trip Safety Inspection <input type="checkbox"/>				
<i>(Checklist to be completed by driver prior to operation of CMV and at the end of each shift and/or change in drivers.)</i>							
Office / Project Name			Project / Location #				
Northwest Harbor Sampling			60588790				
Driver's Full Name (printed)		License #	State / Prov.	Date: Time of Inspection			
Charles Nixon		240392985	LT	dd/mm/yyyy	xx:xx am/pm		
10/25/18				0415/1345			
Power Unit/CMV	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Mercedes Sprinter	34169 ML	NY	4/30/20				
Type of Trailer	License #	State / Prov.	Exp. Date	Registration/Inspection	Expiration		
Insurance Provider	Policy #	State / Prov.	Exp. Date	Provider Contact Information			
Republic-Franklin	5067176	NY					
INSPECTION ITEMS				N/A	YES	NO	DATE CORRECTED
Has this equipment been properly inspected by a CMV competent person and ensured to be in a safe operating condition?					✓		
Are seat belts readily available and operational? Is the horn in working condition?					✓		
Is the overall body condition of the vehicle satisfactory? Properly placarded?					✓		
Is the steering mechanism operational? Are instrument lights fully functional?					✓		
Are all required mirrors present, clean, and adjusted for the CMV operator?					✓		
Do tires meet manufacturer's operational criteria (pressure, tread, spare, etc.)?					✓		
Are back-up alarms installed as required and operational?				✓			
Are service brakes, including trailer brake connections, and parking (hand) brake functional?					✓		
Are turn signals visible and operational?					✓		
Are headlights (low/high beam) operational?					✓		
Are brake lights, tail lights and back-up lights visible and operable?					✓		
Is all cab glass intact and free of distortion? Are wipers, including wiper fluid, operational? As applicable, is an ice scraper available?					✓		
Have all fluids been checked and comply with operations manual criteria?					✓		
Is there a functional fire extinguisher and stocked first aid kit accessible?				✓			
Are there at least three stopped vehicle reflective triangles and a reflective vest?				✓	✓		
If load lines/straps are in use have they been inspected?							
a. Used in accordance with manufacturer's operational guidelines and with regulatory cargo securement requirements?				✓			
b. Rated and approved for this type of load?							
Have all coupling devices been inspected and secured?				✓			
Is the vehicle equipped with the appropriate equipment (e.g. wheel wrench, jack, tire chains)?					✓		
Does the engine and exhaust system appear to be functioning properly?				✓			
Is applicable documentation valid, current and immediately accessible (e.g. insurance, registration, driver medical certificate, CDL, shipping documents, etc.)?				✓			
Driver's Signature/ Inspection Date:		10/25/18					

Americas

(US – CAN) Cargo Inspection

S3AM-320-FM3

<p align="center">Commercial Motor Vehicle (CMV) Cargo Inspection Checklist</p> <p align="center"><i>(The cargo inspection checklist items 1-4 are to be completed by the CMV employee prior to CMV operation.)</i></p>						
Office/ Project Name <i>New Haven Harbor Sampling</i>		Project/ Location Number <i>60588790</i>				
Driver's Full Name (Printed) <i>Charles Nixon</i>		License Number <i>248397985</i>	State / Prov <i>CT</i>	dd/mm/yyyy <i>10/24/18</i>	xx:xx am/pm <i>0415/1245</i>	
Power Unit/CMV <i>Marades</i>	License Number <i>34169 ML</i>	State / Prov <i>NY</i>	Expiration <i>4/30/20</i>	Registration/Certification		
Type of Trailer	License Number	State / Prov	Expiration	Registration/Certification		
INSPECTION ITEMS				N/A	YES	NO
1. Cargo is loaded and secured to prevent: <ul style="list-style-type: none"> a. Loss of load b. Leaking c. Spilling d. Blowing off e. Falling 					✓	
2. Cargo is immobilized or secured to prevent shifting upon or within the vehicle to such an extent that the vehicle's stability or maneuverability is not adversely affected.					✓	
3. The following are secure: <ul style="list-style-type: none"> a. Tailgate b. Tailboard c. Doors d. Tarpaulins e. Spare tire f. Any other devices used to secure the cargo/load 					✓	
4. The cargo or any other object does not: <ul style="list-style-type: none"> a. Obscure the driver's view ahead or to the right or left b. Interfere with the free movement of the driver's arms or legs c. Prevent ready access to accessories required for emergencies d. Prevent the free and ready exit of any person from the CMV 				✓		
5. Inspect and resecure as necessary the cargo and the devices used to secure the cargo within the first 50 miles (80km) after beginning a trip.					✓	
6. Re-examine and resecure the cargo: <ul style="list-style-type: none"> a. When the driver makes a change of duty status b. The CMV has been driven for 3 hours or 150 miles (240km) (whichever comes first) c. These inspection requirements do not apply: <ul style="list-style-type: none"> i. If the container/trailer is sealed and the driver has been provided written direction not to open it to inspect the cargo ii. The cargo has been loaded in a manner that makes inspection of its cargo impracticable 					✓	

Activity Hazard Analysis (AHA)

Activity/Work Task: Working On/ Near Water	Overall Risk Assessment Code (RAC) (Use highest code)					M
Project Location: New Haven Harbor, Connecticut	Risk Assessment Code (RAC) Matrix					
Contract Number: W912WJ-17-D-0003	Severity	Probability				
Date Prepared: 10/17/2018		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Angela Hinkle / Project Scientist	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Kris van Naerssen / Task Order Manager	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk	
					H = High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				M = Moderate Risk	
				L = Low Risk		

Job Steps	Hazards	Controls	RAC
Boat Travel – Travel to Sampling Locations on Water	Environment	<ul style="list-style-type: none"> • Establish safe work practices such as avoiding working on-deck while vessel is underway, avoid leaning over side rails, work in pairs, and avoid moving parts and lines/cables with tension. • Monitor weather conditions • Be aware of tidal levels and proximity to shallow water. • Be aware of underwater debris near site and shoreline. • Personal Flotation Devices, lifejackets, or Mustang Suits shall be worn by all workers who are exposed to the danger of drowning in water deep enough for the lifejacket to be effective. • Whenever there exists the possibility of falling into water, personnel must be attired in a USCG approved Type III or Type V work vest. The vest must be properly sized for the individual and must be secured at all times. • Waders shall never be worn aboard a watercraft of any kind. 	M
	Slip/trip/fall (Rocking of boat, rough waters, unsteady surface while aboard vessel)	<ul style="list-style-type: none"> • Use handrails, trekking poles or other aid to reduce stress on legs and prevent falls. Identify and avoid steep slopes, slippery areas, and wet conditions. • Evaluate work area and access routes for locations where fall prevention may be beneficial to field staff. Install low or zero-impact fall protection (e.g., stake-supported railings, cable, or ropes) as appropriate to provide handholds. 	M
	Man overboard	<ul style="list-style-type: none"> • Cover in tailgate meeting each day procedures for man overboard scenario. • Proper PFDs always required on boat. • A throwable rescue device (Type IV flotation aid) along with whatever equipment (i.e., ladders, lifting gear, or rescue boat) necessary shall be immediately available to recover an individual from the water. • Wear USGS approved cold water immersion suit (a.k.a. Mustang suit) if water temperatures are less than 55°F 	M
	General Boating	<ul style="list-style-type: none"> • Operate vessel in accordance with USCG and local, safe boating practice 	M

Job Steps	Hazards	Controls	RAC
		<ul style="list-style-type: none"> • Only qualified personnel shall operate vessels • Be aware of the location of onboard fire extinguishers, VHF radio, throwable life ring, signaling devices, and first aid kit • Operate vessel only where safe navigation practice allows • Communicate written or verbal "Float Plan" to shore side entity, e.g. onsite project manager 	
	Vessel Collisions / Other Vessel Hazards	<ul style="list-style-type: none"> • Operate vessel in accordance with USCG and local, safe boating practice • Only qualified personnel shall operate vessels • Be aware of the location of onboard fire extinguishers, VHF radio, throwable life ring, signaling devices, and first aid kit • Employ Man Overboard Controls (Above) • Wear USGS approved cold water immersion suit (a.k.a. Mustang suit) if water temperatures are less than 55°F • Wear Hearing protection as appropriate (i.e. if talking above normal levels is not possible) • Have First Aid and CPR trained individuals aboard and be familiar with contents of first aid kits 	M
	Cold/Heat Stress	<ul style="list-style-type: none"> • Provide drinking water and first aid kit. • Wear appropriate clothing for weather conditions, dress in layers. • Buddy system; cold stress monitoring; cold stress control plan (including Mustang Suits, work rotation, methods of warming) as appropriate • Review prevention, symptoms and treatment guidance. 	L

Job Steps	Hazards	Controls	RAC
Near-shore Activities	Slips, Trips, Falls	<ul style="list-style-type: none"> • Practice good housekeeping to keep the ground around the sampling location clear of obstructions, equipment and other tripping hazards. • Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces. • If workers have the potential to get stuck in mud or fluidized sediment, air injection equipment designed to free workers feet/legs may need to be available onsite. At a minimum, a safety line should be available to be deployed from safe ground. If a worker does get stuck, they should not struggle as this causes further sinking. Use a pole to conduct sediment probing to assess water depths, the stability of shoreline terrain, and the bearing capacity of bottom sediments ahead of the chosen path. • Take special care on slippery rocks along shorelines, lakeshores, riverbanks, and creeks. Always look ahead at the ground when walking around the water's edge and avoid stepping on stones that have algal growth. • Waders may not be worn when working along, over, or in moving waters; or in waters influenced by tides or acted upon by waves when water depths exceed knee height unless specifically approved by the SH&E Manager. Waders may be worn in still waters in water depths up to the waist if bottom conditions are firm and well understood. • Waders shall never be worn aboard a watercraft of any kind. 	M
	Biological Hazards	<ul style="list-style-type: none"> • Assess work area for poisonous plants and animals and communicate observations to avoid them. • If hazardous insects or plants such as ticks, poison oaks are identified or suspected in a work area, controls including the use of disposable (Tyvek) coveralls, insect repellent (23.8% DEET or similar), light colored clothing, barrier creams, frequent tick checks should be implemented. • Additionally, all field clothing and equipment should be thoroughly cleaned, removed and/or segregated from clean clothing, equipment and supplies to avoid transfer of hazardous plants/insects. • All employees should bath immediately following fieldwork and 	L

Job Steps	Hazards	Controls	RAC
		use soaps/ cleansers designed to remove oils associated with poison oak, and conduct a full body tick check using a mirror.	
	Adverse Weather	<ul style="list-style-type: none"> • Be aware of changing weather condition and provide appropriate weather gear. • When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place (SIP) 	M

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	
Applicable HASP Section(s):	
Monitoring Instrument(s):	

Additional Safety Considerations
<ul style="list-style-type: none"> • Ensure all personnel have read the Accident Prevention Plan (APP) • Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs BC). • Follow safe driving procedures. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path. • Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate AHAs or SOPs. • Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle. • When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible. • Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting. • Wear nitrile gloves to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures		PPE
S3NA-002-PR1	Stop Work Authority	<p>LEVEL D</p> <ul style="list-style-type: none"> • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants • ANSI approved steel safety-toe boots or approved equivalent • High visibility reflective traffic vest if near moving vehicles • Nitrile Gloves • Leather work gloves • First aid kit (located on vessel) • Personal Floatation Device • Have a radio, cell phone or other communication device for emergency use • Fire extinguisher (located on vessel)
S3NA-001-PR1	Safe Work Standards and Rules	
S3NA-003-PR1	Safety Health & Environment Training	
S3NA-004-PR1	Incident Reporting, Notifications, and Investigation	
S3NA-011-PR1	Fire Protection	
S3NA-013-PR1	Housekeeping	
S3NA-113-PR1	Heat Stress	
S3NA-204-PR1	Environmental Compliance	
S3NA-208-PR1	Personal Protective Equipment	
S3NA-209-PR1	Risk Assessment and Management	
S3NA-209-FM5	Daily Tailgate Meeting Form	
S3NA-315-PR1	Working On and Near Water	
S3NA-315-ATT1	Personal Floatation Devices	
S3NA-333-ATT2	Boating Safe Work Practices	
S3NA-333-ATT4	Float Plan	
S3NA-333-ATT6	Emergency Response Procedures	
S3NA-333-ATT5	Marine Safety Equipment	
S3NA-333-ATT3	Small Boat Operation	
S3NA-333-ATT7	Hazardous Weather Operations	
S3NA-333-ATT8	Charters and Subcontractors	

S3NA-007-FM1	Inspection BBS Checklist	
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Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Research vessel	Safe Boating certificate/ USCG Captain's license (where appropriate).	Equipment will be inspected prior to use. Any safety deficiencies detected will require cessation of activities until appropriate repairs have been made.

Acknowledgement


All employees, subcontractors, and visitors must sign the Acknowledgement form, in this section, before conducting field activities at this site.

By signing this form, AECOM employees agree that:

- I have read this Accident Hazard Analysis and I understand the requirements of the AHA.
- I will conduct work at this site in accordance with the requirements of the AHA.

By signing this form, subcontractors and visitors agree that:

- I have read and understood the potential hazards associated with the site.
- I will ensure compliance with my company's policies on health and safety.

<u>Charles I Nixon, Jr., AECOM</u> Print Name & Company	<u>10/22/18</u> Date	 Signature
<hr/> Print Name & Company	<hr/> Date	<hr/> Signature
<hr/> Print Name & Company	<hr/> Date	<hr/> Signature
<hr/> Print Name & Company	<hr/> Date	<hr/> Signature
<hr/> Print Name & Company	<hr/> Date	<hr/> Signature
<hr/> Print Name & Company	<hr/> Date	<hr/> Signature

Activity Hazard Analysis (AHA)

Activity/Work Task: Boat Based Sediment and Surface Water Sampling	Overall Risk Assessment Code (RAC) (Use highest code)					M	
Project Location: New Haven Harbor, Connecticut	Risk Assessment Code (RAC) Matrix						
Contract Number: W912WJ-17-D-0003	Severity		Probability				
Date Prepared: 10/17/2018			Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Angela Hinkle/ Project Scientist	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name/Title): Kris van Naerssen/ Task Order Manager	Marginal	H	M	M	L	L	
	Negligible	M	L	L	L	L	
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)						
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				RAC Chart		
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk		
					H = High Risk		
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				M = Moderate Risk		
				L = Low Risk			

Job Steps	Hazards	Controls	RAC
Sediment or surface water sampling from vessel	Slips, trips, falls on boat or walking on pier around truck.	<ul style="list-style-type: none"> • Identify and discuss trip/slip hazards on boat pier during safety meetings and throughout the day communicating with all team members in work zone. • Keep work areas free of non-essential equipment, i.e. practice good housekeeping. • Maintain good balance. In rough vessel conditions practice “one hand for you one hand on the boat.” • Wear appropriate footwear for the task. • Install handrail or handrail-chains around perimeter of boat deck as appropriate. 	M
	Man overboard	<ul style="list-style-type: none"> • Cover in tailgate meeting each day procedures for man overboard scenario. • Wear appropriate USCG-approved personal flotation device (PFD). • A throwable rescue device (Type IV flotation aid) along with whatever equipment (i.e., ladders, lifting gear, or rescue boat) necessary shall be immediately available to recover an individual from the water. • Use buddy system when working near water’s edge. • Install handrail or handrail-chains around perimeter of boat deck as appropriate. • Wear USGS approved cold water immersion suit (a.k.a. Mustang suit) if water temperatures are less than 55°F 	M
	Underground Utilities	<ul style="list-style-type: none"> • Confirm utility clearance or presence before invasive work • Plan all vessel and vehicle movements • Observe surroundings prior to sampling 	L
	Lifting and Ergonomic Hazards	<ul style="list-style-type: none"> • Practice correct lifting posture. • Two-person lifts should be used when appropriate, e.g. bulky object lifting. • Use mechanical assistance when appropriate. 	L
	Hand Tools	<ul style="list-style-type: none"> • Use tool appropriate for the task 	L

Job Steps	Hazards	Controls	RAC
		<ul style="list-style-type: none"> • Inspect tools for damage prior to use • Do not use tools with signs of fatigue or structural damage • Wear gloves to protect hands as appropriate for the task • Wear safety glasses as appropriate 	L
	Heavy Equipment Overhead	<ul style="list-style-type: none"> • Communicate with boom operator. Use hand signals if it is too loud to communicate over generator. • Hardhats will be worn on the deck at all times • Stop, look, and assess overhead lifts before attempting. • Confirm shackles, bolts, etc. associated with lifting activities are properly secured 	L
	Inclement Weather	<ul style="list-style-type: none"> • Consult current marine forecast frequently during operations and plan vessel movements accordingly • Suspend or cancel daily vessel operations during high wind or during lightning events • Communicate written or verbal “Float Plan” to shore side entity, e.g. onsite project 	L
	Grab Sampler (sediment or water)	<ul style="list-style-type: none"> • Inspect all elements of grab sampler and lifting apparatus prior to use • Beware of potential pinch hazards – specifically the snapping mechanism on the grab sampler. Ensure that all staff members are clear of the grab sampler while the dredge is open/engaged and ready to sample. • Keep non-essential personnel outside perimeter of work area • Establish routine for movement of sampling device and acquisition/recovery of sample • Decide on team member responsibilities prior to sampling device deployment • Exercise caution handling and opening preserved glassware containers and use appropriate PPE (gloves and eyewear) 	M
	General Boating	<ul style="list-style-type: none"> • Operate vessel in accordance with USCG and local, safe boating 	M

Job Steps	Hazards	Controls	RAC
		<p>practice</p> <ul style="list-style-type: none"> • Only qualified personnel shall operate vessels • Be aware of the location of onboard fire extinguishers, VHF radio, throwable life ring, signaling devices, and first aid kit • Operate vessel only where safe navigation practice allows • Communicate written or verbal "Float Plan" to shore side entity, e.g. onsite project manager 	
	Vessel Collisions / Other Vessel Hazards	<ul style="list-style-type: none"> • Operate vessel in accordance with USCG and local, safe boating practice • Only qualified personnel shall operate vessels • Be aware of the location of onboard fire extinguishers, VHF radio, throwable life ring, signaling devices, and first aid kit • Employ Man Overboard Controls (Above) • Wear USGS approved cold water immersion suit (a.k.a. Mustang suit) if water temperatures are less than 55°F • Wear Hearing protection as appropriate (i.e. if talking above normal levels is not possible) • Have First Aid and CPR trained individuals aboard and be familiar with contents of first aid kits 	M
	Fire	<ul style="list-style-type: none"> • Practice safe fueling of generators and pumps • Maintain contact between fueling nozzle and fuel tank during fueling • Only fuel cool engines, do not fuel a running engine • Be aware of the location of onboard fire extinguisher(s) 	M
	Cold Stress	<ul style="list-style-type: none"> • Provide drinking water and first aid kit. • Wear appropriate clothing for weather conditions, dress in layers. • Buddy system; cold stress monitoring; cold stress control plan (including Mustang Suits, work rotation, methods of warming) as appropriate • Review prevention, symptoms and treatment guidance. 	M

Job Steps	Hazards	Controls	RAC
	Heat Stress	<ul style="list-style-type: none"> • A shaded or cooled shelter (or gathering point) shall be identified for rest periods when working in hot temperatures • Allow for work-rest cycles during periods of high heat • Wear clothing that allows for cooling • Drink liquids and take bathroom breaks to allow rehydration to occur • If necessary work shall be conducted during cooler times of the day, generally early mornings and late afternoon. No night work is permitted 	M
	Sediment Contact	<ul style="list-style-type: none"> • Wear appropriate PPE (gloves, clothing, and eyewear) when working with sediment 	L

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	
Applicable HASP Section(s):	
Monitoring Instrument(s):	

Additional Safety Considerations

- Ensure all personnel have read the Accident Prevention Plan (APP)
- Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs BC).
- Follow safe driving procedures. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path.
- Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate AHAs or SOPs.
- Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle.
- When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible.
- Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting.
- Wear nitrile gloves to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures		PPE
S3NA-002-PR1	Stop Work Authority	LEVEL D
S3NA-001-PR1	Safe Work Standards and Rules	<ul style="list-style-type: none"> • ANSI approved hard hat
S3NA-003-PR1	Safety Health & Environment Training	<ul style="list-style-type: none"> • ANSI approved safety glasses
S3NA-004-PR1	Incident Reporting, Notifications, and Investigation	<ul style="list-style-type: none"> • Shirts with sleeves and full-length pants
S3NA-011-PR1	Fire Protection	<ul style="list-style-type: none"> • ANSI approved steel safety-toe boots or approved equivalent
S3NA-013-PR1	Housekeeping	<ul style="list-style-type: none"> • High visibility reflective traffic vest if near moving vehicles
S3NA-113-PR1	Heat Stress	<ul style="list-style-type: none"> • Nitrile Gloves
S3NA-204-PR1	Environmental Compliance	<ul style="list-style-type: none"> • Hearing Protection
S3NA-208-PR1	Personal Protective Equipment	<ul style="list-style-type: none"> • Leather work gloves
S3NA-209-PR1	Risk Assessment and Management	<ul style="list-style-type: none"> • First aid kit (located on vessel) • Personal Floatation Device / Mustang Suit (For Water Temps <55° F) • Have a radio, cell phone or other communication device for emergency use • Fire extinguisher (located on vessel)

Additional Operational Safety Procedures		PPE
S3NA-209-FM5	Daily Tailgate Meeting Form	
S3NA-315-PR1	Working On and Near Water	
S3NA-315-ATT1	Personal Floatation Devices	
S3NA-333-ATT2	Boating Safe Work Practices	
S3NA-333-ATT4	Float Plan	
S3NA-333-ATT6	Emergency Response Procedures	
S3NA-333-ATT5	Marine Safety Equipment	
S3NA-333-ATT3	Small Boat Operation	
S3NA-333-ATT7	Hazardous Weather Operations	
S3NA-333-ATT8	Charters and Subcontractors	
S3NA-007-FM1	Inspection BBS Checklist	

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Research vessel	Safe Boating certificate/ USCG Captain's license (where appropriate).	Equipment will be inspected prior to use. Any safety deficiencies detected will require cessation of activities until appropriate repairs have been made.
Grab & water sampling device – mounted on side davit, attached to the vessel	Boom will be operated by a competent person, familiar with the equipment. Daily safety briefings specific to the winch equipment will be conducted. Be aware of pinch points	Equipment will be inspected prior to use.

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Charles I Nixon, Jr., AECOM

Print Name & Company

10/22/18

Date

Charles I. Nixon, Jr.

Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

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Print Name & Company

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Activity Hazard Analysis (AHA)

Activity/Work Task: Mobilization	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: New Haven Harbor, Connecticut	Risk Assessment Code (RAC) Matrix	
Contract Number: W912WJ-17-D-0003	Severity	Probability
Date Prepared: 10/9/2018		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Angela Hinkle/ Project Scientist	Catastrophic	E E H H M
Reviewed by (Name/Title): Kris van Naerssen / Task Order Manager	Critical	E H H M L
	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	RAC Chart
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	H = High Risk
Recommended PPE:		
<input checked="" type="checkbox"/> Safety Glasses With Sideshields <input checked="" type="checkbox"/> Steel-Toed Boots <input type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Nitrile Gloves <input checked="" type="checkbox"/> Leather Gloves <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Flame Retardant Clothing		

Job Steps	Hazards	Controls	RAC
Travel and Mobilization to Site	Driving	<ul style="list-style-type: none"> All vehicle operators will be appropriately licensed Complete a pre-use visual inspection. No electronic devices to be used while operating the vehicle. Be aware of road conditions and drive only to your comfort level Drivers will obey all posted speed limits and traffic laws during travel to and from the site Be aware of road conditions and drive only to your comfort level 	M

Job Steps	Hazards	Controls	RAC
		<ul style="list-style-type: none"> • Slowly exit from parking spaces; Seek eye contact with other drivers or pedestrians • Before changing lanes, signal well in advance, check mirrors and over shoulder • Maintain safe distances behind vehicles and stay out of other vehicles' blind spots • DRIVE DEFENSIVELY. Move eyes and scan mirrors at least every 2 seconds • Back into parking spaces (or "pull through") when appropriate • Use a spotter when backing-up or maneuvering around objects or other vehicles • Be familiar with the handling and operation of company or rental vehicles • Assure tires are properly inflated and there is sufficient tread (including spare) • Be mindful of road fatigue. Park in a safe location and get out of the vehicle at regular intervals on long drives. 	
	Hauling Equipment in Vehicles	<ul style="list-style-type: none"> • All equipment and tools will be properly tied down and inspected prior to travel to the site. 	L
Travel and Mobilization to Site (Cont.)	Inclement Weather	<ul style="list-style-type: none"> • Evaluate weather conditions prior to beginning the travel to determine if travel should proceed. Verify your vehicle is equipped to travel in poor weather. Have supplies on hand in the event that you become stranded, including a communication device to call for help. 	L
	Fatigue	<ul style="list-style-type: none"> • Buddy system. Rotation of shifts. Frequent breaks. • Limit work day to 12 hours, including driving time 	L

Job Steps	Hazards	Controls	RAC
Loading / Offloading Equipment	Lifting Heavy Equipment	<ul style="list-style-type: none"> • Use proper lifting techniques by bending and lifting with legs and not back, and do not over extend or twist. Do not lift over 49 lbs. without assistance • Wear work gloves to aid in gripping objects while moving • Use dollies, cart, come-alongs, or rollers whenever possible rather than unassisted lifting by employees 	M
	Pinch Points	<ul style="list-style-type: none"> • Locate potential pinch points and guard as needed. • Warn others prior to closing doors and tailgates 	
	Unstable Equipment	<ul style="list-style-type: none"> • Ensure equipment is being offloaded onto stable, even ground. • Move all offloaded equipment out of direct travel to avoid trips 	L
	Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear safety-toed boots with good tread • Keep walking paths and heavy use work areas clear of obstructions and trip hazards • Use caution if work areas are wet or slippery 	L

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	
Applicable HASP Section(s):	
Monitoring Instrument(s):	

Additional Safety Considerations

1. Ensure all personnel have read the Accident Prevention Plan (APP).
2. Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs BC).
3. Follow safe driving procedures. Always use the buddy system when moving vehicles. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path.
4. Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate AHAs or SOPs.
5. Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle.
6. When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible.
7. Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting.
8. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures		PPE
S3NA-002-PR1	Stop Work Authority	<ul style="list-style-type: none"> • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • Nitrile Gloves • Leather work gloves • First aid kit
S3NA-001-PR1	Safe Work Standards and Rules	
S3NA-003-PR1	Safety Health & Environment Training	
S3NA-004-PR1	Incident Reporting, Notifications, and Investigation	
S3NA-005-PR1	Driving	
S3NA-013-PR1	Housekeeping	
S3NA-208-PR1	Personal Protective Equipment	
S3NA-209-PR1	Risk Assessment and Management	
S3NA-209-FM5	Daily Tailgate Meeting Form	
S3NA-317-PR1	Hand Safety	

S3NA-331-PR1	Underground Utilities	
S3NA-333-ATT6	Emergency Response Procedures	
S3NA-007-FM1	Inspection BBS Checklist	

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Vehicles	<p>Vehicle inspections will be completed prior to use</p> <p>All employees will carry appropriate licensure and trainings for use of motorized vehicles/CMVs.</p>	<p>Visual inspection of all vehicles prior to mobilization</p> <p>Tailgate safety meeting prior to offloading of all equipment at the Site</p>

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Charles I Nixon, Jr., AECOM
Print Name & Company

10/22/18
Date


Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Activity Hazard Analysis (AHA)

Activity/Work Task: Sample Storage/Shipping	Overall Risk Assessment Code (RAC) (Use highest code)	M
Project Location: New Haven Harbor, Connecticut	Risk Assessment Code (RAC) Matrix	
Contract Number: W912WJ-17-D-0003	Severity	Probability
Date Prepared: 10/9/2018		Frequent Likely Occasional Seldom Unlikely
Prepared by (Name/Title): Angela Hinkle /Scientist	Catastrophic	E E H H M
	Critical	E H H M L
Reviewed by (Name/Title): Kris van Naerssen / Task Order Manager	Marginal	H M M L L
	Negligible	M L L L L
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each “ Hazard ” with identified safety “ Controls ” and determine RAC (See above)	
	“ Probability ” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	RAC Chart
	“ Severity ” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.	H = High Risk
		M = Moderate Risk
		L = Low Risk
Recommended PPE:		
<input checked="" type="checkbox"/> Safety Glasses With Sideshields <input checked="" type="checkbox"/> Steel-Toed Boots <input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Nitrile Gloves <input checked="" type="checkbox"/> Leather Gloves <input checked="" type="checkbox"/> Hearing Protection <input type="checkbox"/> Flame Retardant Clothing		

Job Steps	Hazards	Controls	RAC
Sample Collection	Chemical hazards associated with sediment contact	<ul style="list-style-type: none"> • Chemical protective gloves shall be worn for handling sediments and equipment that has come in contact with impacted sediments and surface water. • Safety glasses, goggles, or a face shield shall be worn when handling sediments and surface water. • Personal hygiene facilities shall be maintained for crew members to wash face and hands before eating and before taking breaks. • Food shall be consumed in designated clean areas • Exercise caution handling and opening preserved glassware containers and use appropriate PPE (chemically resistant gloves and appropriate eyewear) 	M
	Decontamination	<ul style="list-style-type: none"> • Wear appropriate PPE (Nitrile gloves, eye protection) • Have eyewash station accessible 	L
Packing and Carrying Equipment	Lifting Heavy Equipment	<ul style="list-style-type: none"> • Use proper lifting techniques by bending and lifting with legs and not back, and do not over extend or twist. Do not lift over 49 lbs. without assistance • Wear work gloves to aid in griping objects while moving • Use dollies, cart, come-alongs, or rollers whenever possible rather than unassisted lifting by employees 	M
	Unstable Equipment	<ul style="list-style-type: none"> • Ensure equipment is being packed and offloaded onto stable, even ground • Move all offloaded equipment out of direct travel to avoid trips 	L
	Slips/Trips/Falls	<ul style="list-style-type: none"> • Wear safety-toed boots with good tread • Keep walking paths and heavy use work areas clear of obstructions and trip hazards • Use caution if work areas are wet or slippery 	L

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	
Applicable HASP Section(s):	
Monitoring Instrument(s):	

Additional Safety Considerations
<ol style="list-style-type: none"> 1. Ensure all personnel have read the Accident Prevention Plan (APP). 2. Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate AHAs or SOPs. 3. Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle. 4. When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible. 5. Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting. 6. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures		PPE
S3NA-002-PR1	Stop Work Authority	<ul style="list-style-type: none"> • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • Nitrile Gloves • Leather work gloves • First aid kit
S3NA-001-PR1	Safe Work Standards and Rules	
S3NA-003-PR1	Safety Health & Environment Training	
S3NA-004-PR1	Incident Reporting, Notifications, and Investigation	
S3NA-013-PR1	Housekeeping	
S3NA-208-PR1	Personal Protective Equipment	
S3NA-209-PR1	Risk Assessment and Management	

S3NA-209-FM5	Daily Tailgate Meeting Form	
S3NA-317-PR1	Hand Safety	
S3NA-333-ATT6	Emergency Response Procedures	
S3NA-007-FM1	Inspection BBS Checklist	

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Vehicles	<p>Vehicle inspections will be completed prior to use</p> <p>All employees will carry appropriate licensure and training for use of motorized vehicles/CMVs.</p>	<p>Visual inspection of all vehicles prior to mobilization</p> <p>Tailgate safety meeting prior to offloading of all equipment at the Site</p>

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Charles I Nixon, Jr., AECOM
Print Name & Company

10/22/18
Date

Charles I. Nixon, Jr.
Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Print Name & Company

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Print Name & Company

Date

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Print Name & Company

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Signature

Acknowledgement

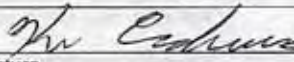
All employees, subcontractors, and visitors must sign the Acknowledgement form, in this section, before conducting field activities at this site.


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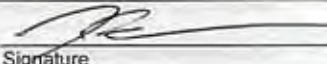
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<u>Ken Cadmus - OSI</u> Print Name & Company	<u>10/27/18</u> Date	 Signature
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<u>MORGAN BARRETT - OSI</u> Print Name & Company	<u>10/23/18</u> Date	 Signature
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<u>KLIS JAN N. ANDERSON</u> Print Name & Company <u>ANDERSON</u>	<u>10/23/18</u> Date	 Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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Ken Cadmus - OSI
Print Name & Company

10/23/18
Date

[Signature]
Signature

Morgan BARRETT - OSI
Print Name & Company

10/23/18
Date

[Signature]
Signature

K. VAN NASSON -
Print Name & Company
AECOM

10/23/18
Date

[Signature]
Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

Signature

Print Name & Company

Date

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<u>Ken Cadmus - OS1</u> Print Name & Company	<u>10/23/18</u> Date	<u>[Signature]</u> Signature
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<u>Morgan BARRETT - OS2</u> Print Name & Company	<u>10/23/18</u> Date	<u>[Signature]</u> Signature
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<u>KRIS RAN NAWSON -</u> Print Name & Company <u>AECOM</u>	<u>12/23/18</u> Date	<u>[Signature]</u> Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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<u>Kris Jan Johnson</u> Print Name & Company <u>AECOM</u>	<u>10/23/18</u> Date	<u>[Signature]</u> Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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_____ Print Name & Company	_____ Date	_____ Signature
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Attachment 3 New Haven Harbor / CLDS Chain of Custody Forms



CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 10/24/18

ALPHA Job #: L1843305

5 Walkup Drive
Westboro, MA 01581
Tel: 508-836-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: **NEW HAVEN HBR**

Project Location: **NEW HAVEN, CT**

Project #:

Project Manager: **REICHARD LOYD / KRIS VANNAESEN**

ALPHA Quote #:

Report Information - Data Deliverables

ADEx EMAIL

Billing Information

Same as Client Info PO #:

Client Information

Client: **USACE / AECOM**

Address: **C96 VIRGINIARD CONCORD, MA 01742**

Phone: **978-318-8048**

Email: **REICHARD.B.LOYD@USACE.ARMY.MIL**

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods

Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

Yes No GW1 Standards (Info Required for Metals & EPH with Targets)

Yes No NPDES RGP

Other State /Fed Program **REM** Criteria **REM**

Additional Project Information:

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	REM METALS	PAHS	PCBS	PESTICIDES	TOC	% MOIST / TS	SAMPLE INFO	TOTAL # BOTTLES
															Filtration	1
															<input type="checkbox"/> Field	1
															<input type="checkbox"/> Lab to do	1
															Preservation	1
															<input type="checkbox"/> Lab to do	1
															Sample Comments	1

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
43305-01	TB-2	10/22	16:50	SE	GJS
02	US-2 00-5.0	10/22	17:20	SE	GJS
03	US-2 5.0-6.0	10/22	17:20	SE	GJS
04	TB-1 0-5.2	10/23	10:25	SE	GJS
05	TB-1 5.2-6.0	10/23	10:25	SE	GJS
06	CAD-3 0-5.5	10/23	11:43	SE	GJS
07	US-1 0-5.5	10/23	12:34	SE	GJS
08	CAD-2 0.5-3	10/23	13:47	SE	GJS
09	CAD-2 5.3-10.8	10/23	14:15	SE	GJS
10	WIP	10/23	13:10	SE	RBL

Container Type	Preservative
P= Plastic	A= None
A= Amber glass	B= HCl
V= Vial	C= HNO ₃
G= Glass	D= H ₂ SO ₄
B= Bacteria cup	E= NaOH
C= Cube	F= MeOH
O= Other	G= NaHSO ₄
E= Encore	H= Na ₂ S ₂ O ₈
D= BOD Bottle	I= Ascorbic Acid
	J= NH ₄ Cl
	K= Zn Acetate
	L= Other

Container Type	AAAAAA
Preservative	AAAAAA

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Richard Bi Lloyd</i>	10/23 18:00	<i>Cheryl...</i>	10/23 18:00
<i>Cheryl...</i>	10/24 13:25	<i>...</i>	10/24 17:33
<i>...</i>	10/24/18 8:09	<i>...</i>	10/24/18 15:09

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FORM NO: 01-01 (rev. 12-Mar-2012)



CHAIN OF CUSTODY

PAGE 2 OF 2Date Rec'd in Lab: 10/24/18ALPHA Job #: 1843205

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: NEW HAVEN HBR

Project Location: NEW HAVEN CT

Project #:

Project Manager: RICHARD LOYD
KRIS VAN NAESEN

ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client Info PO #:

Client Information

Client: USACE / AECOM

Address: 696 VIRGINIA RD
CONCORD, MA 01742

Phone: 978-313-8048

Email: RICHARD.B.LOYD@USACE.ARMY.MIL

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods

Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

Yes No GW1 Standards (Info Required for Metals & EPH with Targets)

Yes No NPDES RGP

Other State /Fed Program REM Criteria REM

Additional Project Information:

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524-2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	EPH: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPI3	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB: <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	REM METALS	PAH S	PCB S	RESIDUES	TOC	% MS/MSD	TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
13305-11	SI				
12	V1	10/23	11:31	SE	RPL
13	SI	10/23	12:05	SE	RBL
14	R1	10/23	12:31	SE	RBL
15	CAD-3 0.1-0.9	10/23	15:00	SE	GJS
16	CAD-1 0-4.0	10/23	15:58	SE	GJS
17	CAD-1 4.4-9.0	10/23	16:30	SE	GJS
18	DS-1 0-7.3	10/23	17:00	SE	GJS
18	DS-2 0-7.0	10/23	17:38	SE	GJS
07	DUP /MS/MSD	10/23	13:10	SE	GJS

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Ericore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₈
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type														
Preservative														

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Richard B. Loyd</u>	<u>10/23 18:00</u>	<u>Chloe</u>	<u>10/23 18:00</u>
<u>Chloe</u>	<u>10/24 13:25</u>	<u>Chloe</u>	<u>10/24 18:15</u>
<u>Kris Van Naezen</u>	<u>10/24 15:00</u>	<u>Chloe</u>	<u>10/24 18:00</u>

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FORM NO: 01-01 (rev 12-Mar-2012)

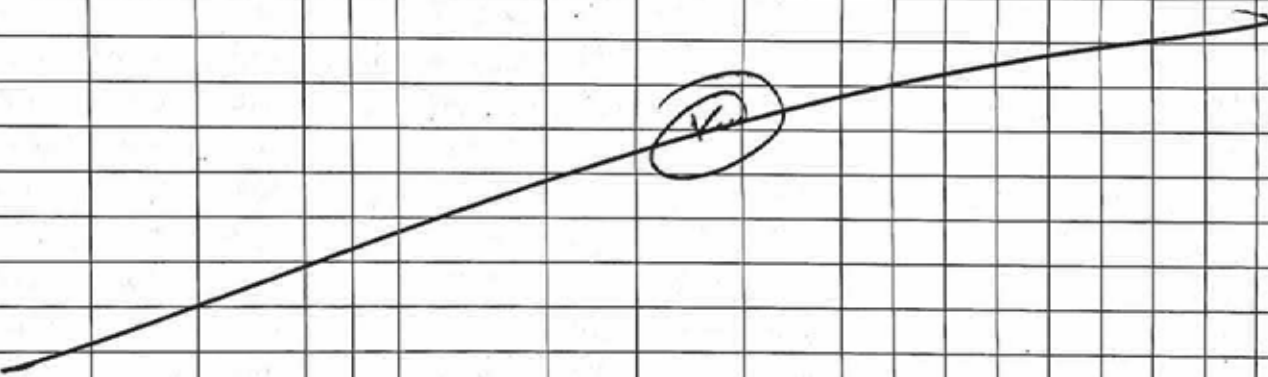
CHAIN OF CUSTODY RECORD

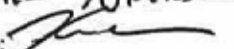

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	ELUTRIATE TESTER	SOS POWDER PHASE TEST	10-DAY WHOLE SED. TOX	28-DAY PROXIMUM	REMARKS
NEW HAVEN HARBOR		SAMPLERS: (Signature) RICHARD LOYD <i>Richard B. Loyd</i>									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/23	11:25	/		COMP V1W	2	/	/		STATIONS U1, W1	
2	10/23	12:15	/		COMP R1S	8	/	/	/	STATIONS R1, S1	
3	10/23	15:27	/		COMP CAD 1-3	9	/	/	/	STATIONS CAD-1, CAD-2, CAD-3	
Relinquished by: (Signature) <i>Richard B. Loyd</i>		Date/Time 10/23/2000	Received by: (Signature) <i>Chap...</i>			Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS				

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Client/Project Name: USACO / AECOM	Project Location: New Haven Harbor / Central LI Disposal Site	Analysis Requested	Container Type P - Plastic A - Amber Glass G - Clear Glass V - VOA Vial O - Other E - Encore Preservation 1 - HCl, 4° 2 - H2SO4, 4° 3 - HNO3, 4° 4 - NaOH, 4° 5 - NaOH/ZnAc, 4° 6 - Na2S2O3, 4° 7 - 4°
Project Number: 60588790	Field Logbook No.:		
Sampler (Print Name)/(Affiliation): K. VAN NAMANSON / AECOM	Chain of Custody Tape Nos.:	N/A	

Signature: 	Send Results/Report to: K. van Naman	TAT: As per work plan	
---	--	------------------------------	--

Field Sample No./Identification	Date	Time	COM P	GRA B	Sample Container (Size/Matf)	Matrix	Preserv.	Field Filtered	EQUIPMENT TROP	SPP APPAY	10-DAY TAP	28-DAY TAP/TROW	Lab I.D.	Remarks
NHH-CLDS	10/23/18	10:28	X	X	3.5 G (6)	SD	7	NO	X	X	X	X		FOR WORK PLAN / REM
NHH-CLDS	10/23/18	13:12	X	X	5 G (10)	SW	7	NO	X	X				
														

Relinquished by: (Print Name)/(Affiliation) K. van Naman / AECOM	Date: 10/23/18	Received by: (Print Name)/(Affiliation) Charles Nixon	Date: 10/23	Analytical Laboratory (Destination):
Signature: 	Time: 17:15	Signature: 	Time: 17:15	
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:	
Signature:	Time:	Signature:	Time:	Sample Shipped Via: Temp blank
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:	
Signature:	Time:	Signature:	Time:	



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 10/24/18

ALPHA Job #: 61843374

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02046
Tel: 508-822-9300

Project InformationProject Name: New Haven Harbor (CLDS)Project Location: CONTRACT 4 DISPOSAL SITEProject #: 60588790Project Manager: K. VAN NABRESSE

ALPHA Quote #:

Report Information - Data Deliverables ADEX EMAIL**Billing Information** Same as Client Info PO #:**Client Information**Client: USACO / AECOMAddress: 500 Enterprise Dr
Rocky Hill, CTPhone: 484.678.1876Email: KRIS.VAN.NABRESSE@AECOM.COM

Additional Project Information:

Turn-Around Time Standard RUSH (only confirmed if pre-approved)

Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods

Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

Yes No GW1 Standards (Info Required for Metals & EPH with Targets)

Yes No NPDES RGP

Other State /Fed Program ITM / RIM Criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
43374-01	NHH-CLDS	10/23/18	1312	W	KJN
02	CLDS-WATER-EDS	10/23/18	1250	W	KJN
03	CLDS-GRAB-SIB	10/23/18	1220	W	KJN

ANALYSIS

VOC: 8280 824 524.2

SVOC: ABN PAH

METALS: MCP 13 MCP 14 RCP 15

EPH: RCRA 5 RCRA 8 PPH 13

VPH: Ranges & Targets Ranges Only

PCB: Ranges & Targets Ranges Only

TPH: Quant Only Fingerprinting

SWOCs

PER

HEX PESTICIDES

RES

RIM CAN CERAMICS

TOTAL METALS

TOTAL METALS

SAMPLE INFO

Filtration
 Field
 Lab to do

Preservation
 Lab to do

Sample Comments

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - E= Encore
 - D= BOD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO₃
 - D= H₂SO₄
 - E= NaOH
 - F= MeOH
 - G= NaHSO₄
 - H= Na₂S₂O₈
 - I= Ascorbic Acid
 - J= NH₄Cl
 - K= Zn Acetate
 - O= Other

Container Type	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>
Preservative	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>C</u>

Relinquished By:	Date/Time	Received By:	Date/Time
<u>[Signature]</u>	10/23/18 1515	<u>[Signature]</u>	10/23/18 1715
<u>[Signature]</u>	10/24/18 1324	<u>[Signature]</u>	10/24/18 1303
<u>[Signature]</u>	10/24/18 1507	<u>[Signature]</u>	10/24/18 1809

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	ELUTERATE PREP	SUSPENDED PHASE	10 DAY WHOLES SECTION	28-DAY BIOACCUM.	REMARKS
		NEW HAVEN HARBOR									
SAMPLERS: (Signature)											
RICHARD LOB Richard B. Long											
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/24		/		COMP TB1-2	8	/	/	/	/	SED FROM STATIONS TB-1 & TB-2
2	10/24		/		COMP DS1-2	5	/	/	/	/	SED FROM STATIONS DS-1 & DS-2
3					COMP US1-2	8	/	/			WATER FROM NEW HAVEN HBR
4					COMP DS1-2	8	/	/			
5					COMP TB1-2	6	/	/			
6					COMP CAD1,2,3	6	/	/			
7					COMP U'W'	6	/	/			
8					COMP R'S'	8	/	/			
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time	Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
<i>Richard B. Long</i>		10/24/15 4:55	<i>Charles N. von</i>		10/24/15 2:55						
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time	Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)		Date/Time	REMARKS					



CHAIN OF CUSTODY

PAGE _____ OF _____

Date Rec'd in Lab: 10/25/18

ALPHA Job #: L1843524

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: NEW HAVEN HARBOR

Project Location: NEW HAVEN, CT

Project #:

Project Manager: RICHARD LOYD / KRIS VAN NEDERSEN

ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Client Information

Client: USAF/ARMY

Address: 696 VIRGINIA RD
CONCORD, MA 01742

Phone: 978-318-8048

Email: RICHARD.B.LOYD@USAF.ARMY.MIL

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Additional Project Information:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program PDM Criteria REM

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	EPH: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPI3	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	TOTAL METALS, HG	HEX CR	PB CONGENERS	PESTICIDES	ARM SUOLS	SAMPLE INFO	TOTAL # BOTTLES
													Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do	
													Preservation <input type="checkbox"/> Lab to do	
													Sample Comments	

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
43524-01	PUMP BLANK	10/24	1420	DI	GSS
02	CORE BLANK	10/24	1400	DI	GSS

Container Type
 P= Plastic
 A= Amber glass
 V= Vial
 G= Glass
 B= Bacteria cup
 C= Cube
 O= Other
 E= Encore
 Q= BOD Bottle

Preservative
 A= None
 B= HCl
 C= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NaHSO₄
 H= Na₂S₂O₈
 I= Ascorbic Acid
 J= NH₄Cl
 K= Zn Acetate
 Q= Other

Container Type

Preservative

P P A A A

C A A A A

Relinquished By: <i>R. B. Loyd</i>	Date/Time 10/24/18 15:45	Received By: <i>Chad</i>	Date/Time 10/24/18
<i>Chad</i>	10/25/18 06:45	<i>[Signature]</i>	10/25/18 06:45

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev 12-Mar-2012)



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: _____ ALPHA Job #: _____

Report Information - Data Deliverables: ADEx EMAIL Same as Client info | PO #: _____

Project Information

Project Name: NEW HAVEN HARBOR

Project Location: NEW HAVEN, CT

Project #: _____

Project Manager: RICHARD LOYD

ALPHA Quote #: _____

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due: _____

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods

Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

Yes No GW1 Standards (Info Required for Metals & EPH with Targets)

Yes No NPDES RGP

Other State / Fed Program _____ Criteria _____

Client Information

Client: US ARMY CORPS OF ENG.

Address: 696 VIRGINIA RD
CONCORD, MA 01742

Phone: 978-318-8048

Email: RICHARD.B.LOYD@USACE.ARMY.MIL

Additional Project Information:

ANALYSIS		SAMPLE INFO
<input type="checkbox"/> TOC	<input type="checkbox"/> DOC	
<input type="checkbox"/> NH ₄ ⁺	<input type="checkbox"/> NO ₂ ⁻	
<input type="checkbox"/> NH ₃	<input type="checkbox"/> NO ₃ ⁻	
<input type="checkbox"/> METALS	<input type="checkbox"/> TA	
<input type="checkbox"/> METALS - CATIONS	<input type="checkbox"/> CHLORIDE	
<input type="checkbox"/> EPH - CATIONS & TARGETS	<input type="checkbox"/> RICKER	
<input type="checkbox"/> PHOSPHATE	<input type="checkbox"/> RANGERS ONLY	
<input type="checkbox"/> CATIONS	<input type="checkbox"/> RANGERS ONLY	
<input type="checkbox"/> NH ₄ ⁺	<input type="checkbox"/> RANGERS ONLY	
<input type="checkbox"/> NH ₃	<input type="checkbox"/> RANGERS ONLY	

ELUSTRATE PREP
SPP TOX
10-DAY WHOLE-SED TOX
28-DAY BIOASSAY

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
	COMP DS 1-2	10/25	9:46	SE	RBL
	COMP US 1-2	10/25	10:23	SE	RBL

Container Type
 P= Plastic
 A= Amber glass
 V= Vial
 G= Glass
 B= Bacteria cup
 C= Cube
 O= Other
 E= Encore
 D= BOD Bottle

Preservative
 A= None
 B= HCl
 C= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NaHSO₄
 H= Na₂S₂O₅
 I= Ascorbic Acid
 J= NH₄Cl
 K= Zn Acetate
 O= Other

Container Type	P P P P P
Preservative	A A A A A

Relinquished By: Richard B. Loyd Date/Time: 10/25 13:30

Received By: John May Date/Time: 10/25 1350

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
 FORM NO: 01-01 (rev. 12-Mar-2012)

Attachment 4 New Haven Harbor / CLDS Field Logs

Attachment 4A New Haven Harbor / CLDS Logbook Entries

CONTENTS

PAGE	REFERENCE-USAID	DATE
1-8	West Point Harbor	10/11/17
9-15	Chobonau Is.	10/17/17
16-21	Plymouth Harbor	12/15/17
22-23	Providence Harbor	06/11/18
24-29	New Haven Harbor Suppl. hotel	10/23/18

"Rite in the Rain"
ALL-WEATHER WRITING PAPER



ALL-WEATHER
LEVEL BOOK

Name K. VAN NARSSON
AECOM

Address ~~500 Endicott Hill Dr.~~
500 ENTERPRISE DR. ROCKY HILL, CT

Phone 484 678-1876

Project ~~600 (12) USAID SUSTAINING DETERM.~~
WESTPORT HARBOR / CCDS SAMPLING

\$25 REWARD IF FOUND & RETURNED
TO 500 APOLLO DR. CHOCOMAS FORD, MA

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	Columnar	Item No. 310	Item No. 310F

11/23/18

(24)

New Haven Harbor Supplemental
CLDS Sampling

0800 ON-SITE - BRANFORD R.

START BOAT LAUNCH

ASCUM - K. VAN NORDEN

OS1 - K. CADWELL - CAPTAIN
M. BARNETT - MATE

42° CLOUDY; 60 FORECAST. CALM WINDS

PROP VESSEL - R/V WILKIN II
& SAMPLING GEAR

0845 SWF BRIEFING

JSA/TSA REVIEW

WEATHER (10:53 LOW TIDE / HIGH H. TIDE)

ON WATER WORK

TARGET 180 SED + 450 H₂O + SUPPLIES

0900 DEPART FOR CLDS REF SITE

0950 CLDS REF SITE ARRIVE

LAUNCH SAMPLER / VESSEL

PREP FOR 500 GAL SAMPLES

18 GALLONS TOTAL - 200 GALS W/

(25)

10/23/18 CLOS Ref site Sample

G1	10:17	86.6'	No Rec.
G2	10:23	85.8	No Rec
G3	10:28	86.2'	No Rec. KW
		See Log	
G4	10:46	85.2'	No Rec.
G5	10:54	84.8	See Log
G6	11:12		No Rec
G7	11:15		No Rec
G8	11:17		See Log
G9	11:40	85.8	" "
G10	11:57		" "

12:05 Prot For GRAB
Sampler Equip. Blank

12:20 GRAB Sampler
Equip Blank collection

12:40 SWITCH over to
Lg Volume Niskin

12:50 Water Sampler
Equipment Blank

(26)

10/23/18 CLOS Ref Site/NM
1300 Reposition on station
for water sampling

1310 on station for
water sampling

1311^{Head} GRAB Sample 1
41,134880'N, -72,834673'

1318 CS N. on calls to
inform KIN → Reefer
Truck Reefer unit
is inoperative. Joe
Fouchas is Answer -
Will fix or send
Replacement ASAP

Water Grab Sample #2

1334 Water GRAB Sample #3
41,134829'N, -72,834646'

1358 " " " #4
41,134845'N, -72,834676'

1424 " " " #5
41,134809'N, -72,834633'

1438 " " " #6
41,134866'N, -72,834757'

1459 " " " #7
41,134859'N, -72,834736'

Return/deliver

(27)

NHH / CCDS

10/23/18 (cont)

1515 WATER GRAB SAMPLE #8
41.134884°N, -72.834707°E

1530 Return towards Brandford

1550 Cool Fox Bringing Replenishment

1605 Return to Dock for CJ

Haul Boat / Demos

Complete Cleanup / Sample collection (had to bring CCDS H2O2 ashore in Coltrane's → 4th SONS [not pred. cited] at Ref Site this afternoon

1700 OSI offsite 10x ^{6x3.5 NHH CCDS SW} ^{NHH CCDS HW}

1715 SIGN SAMPLES over to ^{Equip Blank} ^{CCDS HW (tbl)}

1725 CS Nixon offsite to meet R. Lloyd

1735 K. JAN Npessow offsite → ^{Work} ^{Plan}

1800 AT WEST HAWAII BOAT RAMP
- Discuss project w/ USA CO

(28)

NHH / CCDS 10/23/18

Personnel (R. Lloyd, A. Hopkins, [unclear])

- Per ACE - no demo site H2O2 collected to DATE -

1815 DEPART W. HAWAII will infer 251
RETURN TRAVEL

NORTH VIA
POLICE Hill office

2000 RETURN HAWAII / END



10.23.18 New Haven Harbor Sed. Sampling
tasks: Pick up samples for delivery to New Hampshire
Driver: CJ Nixon (CJN)
Weather: Clear 60s

1245: CJN performs pre-trip safety check
of van.

CJN arrives at Branford boat launch at 1315.

Reefer unit not working. CJN calls Cool Fox, who
will deliver identical replacement van to West Haven
boat launch around 1700 10/23. CJN informs
Kris Van Naerssen.

Cool Fox ~~same~~ driver arrives at West Haven at 1545.
Joe noted that driver would arrive at 1700, CJN has
driver go to Branford River launch to drop off van.

Van is dropped at Branford launch and confirmed to be in operating
condition.

CJN ~~drop~~ loads samples and departs for West Haven at 1715,
arrives at West Haven at 1735. Thermostat set to 30°F.

Samples are loaded onto van, CJ sets thermostat to 30°F, confirms
30°F with second thermometer.

CJN departs west haven at 1815, arrives home at 1845. Van
plugged in and set to 30°F for the night. Temp
confirmed at 32° on aux. thermometer. Ice purchased at
grocery store to further cool samples (20 20 lb bags).

* all temp checks performed with auxiliary thermometer

10.24.18

Task - deliver samples to New Hampshire, return to West Haven for pickup

Weather: Clear, 40s

Driver: CJN

0530 CJN completes vehicle inspection, prepares Alpha samples for courier pickup

0630 CJN ~~to~~ checks temp of cargo area (29°F), departs for New Hampshire

0730 Reefer unit starts displaying warning light and stops cooling. CJN stops, restarts reefer, re-checks temperature (30°F), continues on route

1000 CJN arrives at EGI in New Hampshire, confirms cargo box temp at 30°F , unloads samples

1045 CJN departs New Hampshire for West Haven

1315 CJN forgot to relinquish Alpha chain, meets Alpha Courier at Rocky Hill to relinquish samples to courier

1445 CJN departs Rocky Hill for West Haven

1530 CJN arrives at West Haven boat ramp. Samples are loaded, covered in bagged ice, and thermostat is confirmed at 30°F . Temp is confirmed with aux. thermometer.

1600 CJN departs for home, arrives at 1630, Van plugged in for overnight standby. 30°F confirmed in cargo box.

* All temp checks performed with auxiliary thermometer

1025.18

Task: deliver samples to New Hampshire, pickup at West Haven, deliver to New Hampshire

Weather: clear, 30s

Driver: CJN

0415 CJN inspects vehicle, confirms cargo box at 29°F ,
departs for New Hampshire at 0430

-- Per discussion with Alpha Labs, CJN will stop
at Alpha in Westborough, MA

0630 CJN arrives at Alpha Labs, Reefer unit malfunctioning.
CJN attempts restart, unit turns back on, CJN completes
sample drop off and departs for New Hampshire at 0645

0800 Reefer unit malfunctions again. CJN stops and attempts
restart, but fails. Temp is confirmed at 30°F , CJN continues
to ESI.

0822 CJN arrives at ESI. Temp is checked and is at 35°F .

Samples unloaded, chain and received samples do not match.

Ben Loyd notes he made a mistake on the COC, he will note
changes to lab via e-mail

0900 CJN departs for West Haven

0945 after failure of reefer unit to turn on, CJN pulls over
to call and inform Kris van Naebergen and Joe Fuchs (Cool Fox),
CJN will continue on route and ice samples in lieu of running
reefer unit.

1345 CJN arrives at West Haven. Reefer unit turned back on about 1315, CJN checked cargo box temp which is 34°F upon arrival at West Haven. Samples are iced and thermostat set for 30°F .

1400 CJN departs for New Hampshire. Reefer unit working intermittently.

Temp checks: 1505 30°F (checked with ax thermometer)
1642 34°F
1712 35°F
1758 36°F

1800 CJN arrives at New Hampshire, Cargo box measured at 36°F .

Samples unloaded, reefer unit turned off.

1830 CJN departs for home

1030 CJN arrives home

10/26

0900 CJN cleans van, hoses out cargo box, calls Cool Fox to take van off rent

10/24-10/25 reefer unit issues

On both 10/24 and 10/25, the reefer unit on the van malfunctioned. On 10/24, the unit was re-started once and continued running. The reefer unit also worked without fail when on electric standby.

On 10/25, the reefer unit failed again about 0800. CJN attempted to restart the unit, but failed. Per discussion with Kris van Naerssen, the samples were iced down and temperature was checked periodically. Temps in the cargo box climbed but did not exceed 40°F.

The second trip on 10/25 would use ice in lieu of reefer unit per conversation with Kris van Naerssen.

CJN did get the reefer unit to turn on about 1/2 hour from West Haven on 10/25. Reefer unit continued working for approx 1/2 hour, and failed. Temp was checked periodically, noted in daily logs. Ice was used to chill samples.

Attachment 4B CLDS Sediment Grab Collection Records

Sediment Grab Collection Record



Location ID CLDS Ref Date 10/23/16 Project # 60588790
 Sampler K. VAN NUNEN Contractor AECOM/OSI Vessel William, II
 Weather Cloudy 50°
 Sampling Equipment MODIFIED VAN VORN Diameter in 17
 Target Northing 41 08.10' N Easting 72 50.00' W NAD83 Stateplane Feet

Grab Number 1 Time 24hr 10:15 Water Depth ft 86.6 # Attempts 1
 Actual Northing 41,13485 Easting -72,834650 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks - No Recovery. Down line triggered saw per capture
 Actual Penetration Depth ft 0
 Recovered Length ft 0
 Recovery % 0
 RPD cm — Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm N/A H2S ppm N/A Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number 2 Time 24hr 10:23 Water Depth ft 85.8 # Attempts 1
 Actual Northing 41,134832 Easting -72,834629 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks - NO Recovery
 Actual Penetration Depth ft —
 Recovered Length ft —
 Recovery % —
 RPD cm — Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number 3 Time 24hr 10:28 Water Depth ft 86.2 # Attempts 1
 Actual Northing 41,134857 Easting -72,834699 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks ONE small Turb + possible wave NOTES 95% DARK GRAY, SLIGHT BANDS BLACK! 2cm BROWN ATOT
 Actual Penetration Depth ft 1
 Recovered Length ft 1
 Recovery % 100
 RPD cm 2 Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Sediment Grab Collection Record

AECOM

Location ID NHH-CLDS Date 10/23/18 Project # 6058879
 Sampler K. JAN NAKSON Contractor AECOM/OSI Vessel Willing 4
 Weather Cloudy 50°
 Sampling Equipment MOD. FIDIS 01-N Diameter in 12
 Target Northing 41 08.00N Easting 72 50.00W #ADB3 Stateplane Feet

Grab Number 64 Time 24hr 10:46 Water Depth ft 85.2 # Attempts 1
 Actual Northing 41.134850 Easting -72.834648 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks No Recovery
 Actual Penetration Depth ft 0
 Recovered Length ft
 Recovery %
 RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number 65 Time 24hr 10:54 Water Depth ft 84.8 # Attempts 1
 Actual Northing 41.134870 Easting -72.834671 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks Few small (1-2 cm) shells
 Actual Penetration Depth ft 1
 Recovered Length ft 1
 Recovery % 100
 RPD cm 3 Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number 66 Time 24hr 11:12 Water Depth ft 85.0 # Attempts 1
 Actual Northing 41.134852 Easting -72.834705 Distance from target ft 0
 Target Penetration Depth ft 1.0 Remarks No Recovery
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %
 RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Sediment Grab Collection Record



Location ID CL35 R05 Date 10/23/18 Project # 6058879d
 Sampler K. VAN NIEREN Contractor AECOM/OSI Vessel William II
 Weather Cloudy 50°
 Sampling Equipment MAR-FUN VAN VEEN Diameter in 12
 Target Northing 41° 08.12" N Easting 72 50.06" W LATITUDE - ALSO RECORDS
 - NAD83 Stateplane Feet CT STATE PLN

Grab Number G7 Time 24hr 11:15 Water Depth ft 86.7 # Attempts 1
 Actual Northing 41.134880 Easting -72.834697 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks No Recovery
 Actual Penetration Depth ft 0
 Recovered Length ft 0
 Recovery % 0
 RPD cm — Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number G8 Time 24hr 11:19 Water Depth ft 86.0 # Attempts 1
 Actual Northing 41.134880 Easting -72.834661 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks - Small water tube (2)
 - No odor/sheen, etc.
 sm. black streak noted
 Actual Penetration Depth ft 1
 Recovered Length ft 1
 Recovery % 100
 RPD cm 3 Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number G9 Time 24hr 11:40 Water Depth ft 88.0 # Attempts 1
 Actual Northing 41.134848 Easting -72.834637 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks - small watch ~2"
 - No live organisms noted
 - slight sulfur odor noted
 Actual Penetration Depth ft 1
 Recovered Length ft 1
 Recovery % 100
 RPD cm 3 Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No


Sediment Grab Collection Record




Location ID CUDS RIF Date 10/23/18 Project # G0588790
 Sampler K. VAN NAESSON Contractor Aecom/USI Vessel Willing II
 Weather Cloudy, 50°
 Sampling Equipment MODIFIED VAN NAESSON Diameter in 12
 Target Northing 41°08'10N Easting 72°50.06'W NAD83 Stateplane Feet LAT LONG (Also 201100 WGS 84 ST. 7111)

Grab Number G-10 Time 24hr 11:56 Water Depth ft 83.5 # Attempts 1
 Actual Northing 41,134 886 Easting 72,834 704 Distance from target ft 0
 Target Penetration Depth ft 1 Remarks - Sample low to curb
 Actual Penetration Depth ft 1
 Recovered Length ft 1
 Recovery % 100

RPD cm 2 Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm — H2S ppm — Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number Time 24hr Water Depth ft # Attempts
 Actual Northing Easting Distance from target ft
 Target Penetration Depth ft Remarks 
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %

RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Grab Number Time 24hr Water Depth ft # Attempts
 Actual Northing Easting Distance from target ft
 Target Penetration Depth ft Remarks 
 Actual Penetration Depth ft
 Recovered Length ft
 Recovery %

RPD cm Texture all Clay Clay+Silt Silt Silt+Sand Sand Sand+Gravel Gravel
 PID ppm H2S ppm Color Black Dark Gray Light Gray Brown Tan Green
 Debris Yes No Oil sheen Yes No Visible biology Yes No

Appendix C: Chemistry Data

Appendix C.1: Elutriate Chemistry Lab Report

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

21 December, 2018

Elutriate Chemistry Report (Final)



ANALYTICAL REPORT

Lab Number:	L1843374
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 6.0
Report Date:	11/15/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1843374-01	NHH-CLDS	WATER	NEW HAVEN, CT	10/23/18 13:12	10/24/18
L1843374-02	CLDS-WATER-EB	WATER	NEW HAVEN, CT	10/23/18 12:50	10/24/18
L1843374-03	CLDS-GRAB-EB	WATER	NEW HAVEN, CT	10/23/18 12:20	10/24/18

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Pesticides

L1843374-02: The surrogate recoveries were outside the acceptance criteria for bz198 (29%/29%); however, the criteria were achieved upon re-extraction outside of holding time. The results of both extractions are reported; however, all associated compounds are considered to have a potential bias.

L1843374-03: The surrogate recoveries were outside the acceptance criteria for dbob (26%) and bz198 (24%/23%); however, the criteria were achieved upon re-extraction outside of holding time. The results of both extractions are reported; however, all associated compounds are considered to have a potential bias.

The WG1173904-5 MS recoveries, performed on L1843374-01, are outside the acceptance criteria for several compounds; however, the associated LCS/LCSD recoveries are within overall method allowances. The results of the native sample are considered to have a potentially low bias for heptachlor (37%), aldrin (33%) and toxaphene (0%).

The WG1173904-6 MSD recoveries, performed on L1843374-01, are outside the acceptance criteria for several compounds; however, the associated LCS/LCSD recoveries are within overall method allowances. The results of the native sample are considered to have a potentially high bias for heptachlor epoxide (142%) and a potentially low bias for heptachlor (49%), aldrin (44%) and toxaphene (0%).

Total Metals

The WG1176966-1 Method Blank, associated with L1843374-01, has a concentration above the reporting limit for zinc. Since the sample was non-detect to the RL for this target analyte, no further actions were taken. The results of the original analysis are reported.

The WG1176966-2 LCS recoveries, associated with L1843374-01, were below the acceptance criteria for cadmium (16%), chromium (5.6%), copper (13%), lead (17%), nickel (12%), silver (1.3%) and zinc (16%); the sample was rerun and gave similar results. The results of the original analyses are reported; however, all results are considered to have a potentially low bias for these analytes.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Case Narrative (continued)

The WG1176966-3 MS recoveries, performed on L1843374-01, are below the acceptance criteria for cadmium (15%), chromium (1.3%), copper (13%), lead (17%), nickel (12%), silver (2%) and zinc (15%). The results of the native sample are considered to have a potentially low bias for these analytes.

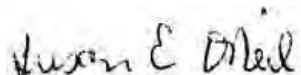
The WG1176966-4 Laboratory Duplicate RPD for nickel (49%), performed on L1843374-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

Hexavalent Chromium

L1843374-01, -02, and -03 were analyzed with the method required holding time exceeded.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 11/15/18

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-01
 Client ID: NHH-CLDS
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:12
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 17:34
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.10	0.459	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	76		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-02
 Client ID: CLDS-WATER-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 19:36
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.98	0.432	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			83		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-03
 Client ID: CLDS-GRAB-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 20:07
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.22	0.484	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	74		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
 Analytical Date: 11/09/18 11:57
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL
RIM Semivolatile Organics by GC/MS - Mansfield Lab for sample(s): 01-03 Batch: WG1173998-1					
Pentachlorophenol	ND		ug/l	2.00	0.436

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	93		30-150

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-03 Batch: WG1173998-2 WG1173998-3								
Pentachlorophenol	77		78		50-120	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,6-Tribromophenol	95		93		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173998-5 WG1173998-6 QC Sample: L1843374-01 Client ID: NHH-CLDS												
Pentachlorophenol	ND	11.1	8.08	73		7.43	73		50-120	8		30

<i>Surrogate</i>	<i>MS % Recovery Qualifier</i>		<i>MSD % Recovery Qualifier</i>		<i>Acceptance Criteria</i>
2,4,6-Tribromophenol		91		88	30-150

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173998-4 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Pentachlorophenol	ND	ND	ug/l	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	76		84		30-150



PCBS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-01
Client ID: NHH-CLDS
Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:12
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 11/10/18 15:08
Analyst: GP

Extraction Method: EPA 3510C
Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.0011	0.0005	1
CI3-BZ#18	ND		ug/l	0.0011	0.0005	1
CI3-BZ#28	ND		ug/l	0.0011	0.0005	1
CI4-BZ#44	ND		ug/l	0.0011	0.0005	1
CI4-BZ#49	ND		ug/l	0.0011	0.0005	1
CI4-BZ#52	ND		ug/l	0.0011	0.0005	1
CI4-BZ#66	ND		ug/l	0.0011	0.0005	1
CI5-BZ#87	ND		ug/l	0.0011	0.0005	1
CI5-BZ#101	ND		ug/l	0.0011	0.0005	1
CI5-BZ#105	ND		ug/l	0.0011	0.0005	1
CI5-BZ#118	ND		ug/l	0.0011	0.0005	1
CI6-BZ#128	ND		ug/l	0.0011	0.0005	1
CI6-BZ#138	ND		ug/l	0.0011	0.0005	1
CI6-BZ#153	ND		ug/l	0.0011	0.0005	1
CI7-BZ#170	ND		ug/l	0.0011	0.0005	1
CI7-BZ#180	ND		ug/l	0.0011	0.0005	1
CI7-BZ#183	ND		ug/l	0.0011	0.0005	1
CI7-BZ#184	ND		ug/l	0.0011	0.0005	1
CI7-BZ#187	ND		ug/l	0.0011	0.0005	1
CI8-BZ#195	ND		ug/l	0.0011	0.0005	1
CI9-BZ#206	ND		ug/l	0.0011	0.0005	1
CI10-BZ#209	ND		ug/l	0.0011	0.0005	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	76		30-150
BZ 198	65		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-02
 Client ID: CLDS-WATER-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/10/18 17:23
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.0010	0.0005	1
CI3-BZ#18	ND		ug/l	0.0010	0.0005	1
CI3-BZ#28	ND		ug/l	0.0010	0.0005	1
CI4-BZ#44	ND		ug/l	0.0010	0.0005	1
CI4-BZ#49	ND		ug/l	0.0010	0.0005	1
CI4-BZ#52	ND		ug/l	0.0010	0.0005	1
CI4-BZ#66	ND		ug/l	0.0010	0.0005	1
CI5-BZ#87	ND		ug/l	0.0010	0.0005	1
CI5-BZ#101	ND		ug/l	0.0010	0.0005	1
CI5-BZ#105	ND		ug/l	0.0010	0.0005	1
CI5-BZ#118	ND		ug/l	0.0010	0.0005	1
CI6-BZ#128	ND		ug/l	0.0010	0.0005	1
CI6-BZ#138	ND		ug/l	0.0010	0.0005	1
CI6-BZ#153	ND		ug/l	0.0010	0.0005	1
CI7-BZ#170	ND		ug/l	0.0010	0.0005	1
CI7-BZ#180	ND		ug/l	0.0010	0.0005	1
CI7-BZ#183	ND		ug/l	0.0010	0.0005	1
CI7-BZ#184	ND		ug/l	0.0010	0.0005	1
CI7-BZ#187	ND		ug/l	0.0010	0.0005	1
CI8-BZ#195	ND		ug/l	0.0010	0.0005	1
CI9-BZ#206	ND		ug/l	0.0010	0.0005	1
CI10-BZ#209	ND		ug/l	0.0010	0.0005	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	66		30-150
BZ 198	42		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-03
 Client ID: CLDS-GRAB-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/10/18 17:57
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.0011	0.0005	1
CI3-BZ#18	ND		ug/l	0.0011	0.0005	1
CI3-BZ#28	ND		ug/l	0.0011	0.0005	1
CI4-BZ#44	ND		ug/l	0.0011	0.0005	1
CI4-BZ#49	ND		ug/l	0.0011	0.0005	1
CI4-BZ#52	ND		ug/l	0.0011	0.0005	1
CI4-BZ#66	ND		ug/l	0.0011	0.0005	1
CI5-BZ#87	ND		ug/l	0.0011	0.0005	1
CI5-BZ#101	ND		ug/l	0.0011	0.0005	1
CI5-BZ#105	ND		ug/l	0.0011	0.0005	1
CI5-BZ#118	ND		ug/l	0.0011	0.0005	1
CI6-BZ#128	ND		ug/l	0.0011	0.0005	1
CI6-BZ#138	ND		ug/l	0.0011	0.0005	1
CI6-BZ#153	ND		ug/l	0.0011	0.0005	1
CI7-BZ#170	ND		ug/l	0.0011	0.0005	1
CI7-BZ#180	ND		ug/l	0.0011	0.0005	1
CI7-BZ#183	ND		ug/l	0.0011	0.0005	1
CI7-BZ#184	ND		ug/l	0.0011	0.0005	1
CI7-BZ#187	ND		ug/l	0.0011	0.0005	1
CI8-BZ#195	ND		ug/l	0.0011	0.0005	1
CI9-BZ#206	ND		ug/l	0.0011	0.0005	1
CI10-BZ#209	ND		ug/l	0.0011	0.0005	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	44		30-150
BZ 198	35		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 11/10/18 13:27
Analyst: GP

Extraction Method: EPA 3510C
Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL
PCB Congeners (RIM List) - Mansfield Lab for sample(s): 01-03 Batch: WG1173900-1					
C12-BZ#8	ND		ug/l	0.0010	0.0005
C13-BZ#18	ND		ug/l	0.0010	0.0005
C13-BZ#28	ND		ug/l	0.0010	0.0005
C14-BZ#44	ND		ug/l	0.0010	0.0005
C14-BZ#49	ND		ug/l	0.0010	0.0005
C14-BZ#52	ND		ug/l	0.0010	0.0005
C14-BZ#66	ND		ug/l	0.0010	0.0005
C15-BZ#87	ND		ug/l	0.0010	0.0005
C15-BZ#101	ND		ug/l	0.0010	0.0005
C15-BZ#105	ND		ug/l	0.0010	0.0005
C15-BZ#118	ND		ug/l	0.0010	0.0005
C16-BZ#128	ND		ug/l	0.0010	0.0005
C16-BZ#138	ND		ug/l	0.0010	0.0005
C16-BZ#153	ND		ug/l	0.0010	0.0005
C17-BZ#170	ND		ug/l	0.0010	0.0005
C17-BZ#180	ND		ug/l	0.0010	0.0005
C17-BZ#183	ND		ug/l	0.0010	0.0005
C17-BZ#184	ND		ug/l	0.0010	0.0005
C17-BZ#187	ND		ug/l	0.0010	0.0005
C18-BZ#195	ND		ug/l	0.0010	0.0005
C19-BZ#206	ND		ug/l	0.0010	0.0005
C110-BZ#209	ND		ug/l	0.0010	0.0005

Surrogate	%Recovery	Qualifier	Acceptance Criteria
DBOB	105		30-150
BZ 198	98		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 Batch: WG1173900-2 WG1173900-3								
Cl2-BZ#8	75		76		50-120	1		30
Cl3-BZ#18	77		77		50-120	0		30
Cl3-BZ#28	82		80		50-120	2		30
Cl4-BZ#44	88		88		50-120	0		30
Cl4-BZ#49	88		85		50-120	3		30
Cl4-BZ#52	84		83		50-120	1		30
Cl4-BZ#66	89		86		50-120	3		30
Cl5-BZ#87	92		89		50-120	3		30
Cl5-BZ#101	93		89		50-120	4		30
Cl5-BZ#105	94		92		50-120	2		30
Cl5-BZ#118	91		88		50-120	3		30
Cl6-BZ#128	90		87		50-120	3		30
Cl6-BZ#138	92		89		50-120	3		30
Cl6-BZ#153	91		87		50-120	4		30
Cl7-BZ#170	92		87		50-120	6		30
Cl7-BZ#180	88		85		50-120	3		30
Cl7-BZ#183	87		83		50-120	5		30
Cl7-BZ#184	92		87		50-120	6		30
Cl7-BZ#187	87		84		50-120	4		30
Cl8-BZ#195	97		92		50-120	5		30
Cl9-BZ#206	96		93		50-120	3		30
Cl10-BZ#209	93		90		50-120	3		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 Batch: WG1173900-2 WG1173900-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
DBOB	96		100		30-150
BZ 198	92		85		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173900-5 WG1173900-6 QC Sample: L1843374-01 Client ID: NHH-CLDS												
CI2-BZ#8	ND	0.103	0.057	55		0.053	51		50-120	7		30
CI3-BZ#18	ND	0.103	0.057	56		0.054	52		50-120	6		30
CI3-BZ#28	ND	0.103	0.072	70		0.065	63		50-120	11		30
CI4-BZ#44	ND	0.103	0.081	78		0.072	70		50-120	11		30
CI4-BZ#49	ND	0.103	0.075	73		0.069	67		50-120	9		30
CI4-BZ#52	ND	0.103	0.074	72		0.064	62		50-120	14		30
CI4-BZ#66	ND	0.103	0.083	81		0.073	71		50-120	13		30
CI5-BZ#87	ND	0.103	0.085	82		0.074	71		50-120	14		30
CI5-BZ#101	ND	0.103	0.084	82		0.074	71		50-120	13		30
CI5-BZ#105	ND	0.103	0.088	85		0.077	75		50-120	12		30
CI5-BZ#118	ND	0.103	0.082	80		0.073	71		50-120	11		30
CI6-BZ#128	ND	0.103	0.082	80		0.073	70		50-120	12		30
CI6-BZ#138	ND	0.103	0.084	81		0.073	71		50-120	13		30
CI6-BZ#153	ND	0.103	0.082	79		0.072	70		50-120	13		30
CI7-BZ#170	ND	0.103	0.084	82		0.074	72		50-120	13		30
CI7-BZ#180	ND	0.103	0.078	76		0.069	67		50-120	12		30
CI7-BZ#183	ND	0.103	0.078	76		0.068	66		50-120	14		30
CI7-BZ#184	ND	0.103	0.079	77		0.070	68		50-120	12		30
CI7-BZ#187	ND	0.103	0.079	77		0.070	68		50-120	12		30
CI8-BZ#195	ND	0.103	0.088	85		0.078	75		50-120	12		30
CI9-BZ#206	ND	0.103	0.086	83		0.075	73		50-120	13		30
CI10-BZ#209	ND	0.103	0.080	78		0.072	70		50-120	10		30

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173900-5 WG1173900-6 QC Sample: L1843374-01 Client ID: NHH-CLDS												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
BZ 198	69		57		30-150
DBOB	74		66		30-150



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843374

Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173900-4 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Cl2-BZ#8	ND	ND	ug/l	NC		30
Cl3-BZ#18	ND	ND	ug/l	NC		30
Cl3-BZ#28	ND	ND	ug/l	NC		30
Cl4-BZ#44	ND	ND	ug/l	NC		30
Cl4-BZ#49	ND	ND	ug/l	NC		30
Cl4-BZ#52	ND	ND	ug/l	NC		30
Cl4-BZ#66	ND	ND	ug/l	NC		30
Cl5-BZ#87	ND	ND	ug/l	NC		30
Cl5-BZ#101	ND	ND	ug/l	NC		30
Cl5-BZ#105	ND	ND	ug/l	NC		30
Cl5-BZ#118	ND	ND	ug/l	NC		30
Cl6-BZ#128	ND	ND	ug/l	NC		30
Cl6-BZ#138	ND	ND	ug/l	NC		30
Cl6-BZ#153	ND	ND	ug/l	NC		30
Cl7-BZ#170	ND	ND	ug/l	NC		30
Cl7-BZ#180	ND	ND	ug/l	NC		30
Cl7-BZ#183	ND	ND	ug/l	NC		30
Cl7-BZ#184	ND	ND	ug/l	NC		30
Cl7-BZ#187	ND	ND	ug/l	NC		30
Cl8-BZ#195	ND	ND	ug/l	NC		30
Cl9-BZ#206	ND	ND	ug/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173900-4 QC Sample: L1843374-01 Client ID: NHH-CLDS						
CI10-BZ#209	ND	ND	ug/l	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
DBOB	76		81		30-150
BZ 198	65		75		30-150



PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-01
 Client ID: NHH-CLDS
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:12
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 10/31/18 17:32
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	B
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0263	0.0131	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	44		30-150	A
BZ 198	45		30-150	A
DBOB	51		30-150	B
BZ 198	47		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-02
 Client ID: CLDS-WATER-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 10/31/18 19:48
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	0.0007		ug/l	0.0004	0.0004	1	B
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Dieldrin	ND		ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0238	0.0119	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	44		30-150	A
BZ 198	29	Q	30-150	A
DBOB	37		30-150	B
BZ 198	29	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-02 RE
 Client ID: CLDS-WATER-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/12/18 15:16
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0015	P	ug/l	0.0005	0.0005	1	B
Dieldrin	0.0012		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	0.0016	P	ug/l	0.0005	0.0005	1	B
Toxaphene	ND		ug/l	0.0263	0.0131	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	105		30-150	A
BZ 198	78		30-150	A
DBOB	81		30-150	B
BZ 198	80		30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-03
 Client ID: CLDS-GRAB-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 10/31/18 20:22
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0005		ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0266	0.0133	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	30		30-150	A
BZ 198	24	Q	30-150	A
DBOB	26	Q	30-150	B
BZ 198	23	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

SAMPLE RESULTS

Lab ID: L1843374-03 RE
 Client ID: CLDS-GRAB-EB
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/12/18 15:50
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0263	0.0131	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	75		30-150	A
BZ 198	55		30-150	A
DBOB	68		30-150	B
BZ 198	57		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8081B
Analytical Date: 10/31/18 15:50
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-03 Batch: WG1173904-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Endosulfan I	ND		ug/l	0.0005	0.0005	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	58		30-150	A
BZ 198	63		30-150	A
DBOB	64		30-150	B
BZ 198	65		30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
 Analytical Date: 11/12/18 12:26
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 02-03 Batch: WG1177505-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B
Endosulfan I	ND		ug/l	0.0005	0.0005	B
cis-Chlordane	ND		ug/l	0.0005	0.0005	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	A
BZ 198	82		30-150	A
DBOB	86		30-150	B
BZ 198	89		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03 Batch: WG1173904-2 WG1173904-3									
gamma-BHC	55		56		50-120	3		30	A
Heptachlor	61		63		50-120	3		30	A
Aldrin	63		65		50-120	2		30	A
Chloropyrifos	53		58		50-120	8		30	A
trans-Chlordane	73		75		50-120	2		30	A
Endosulfan I	70		71		50-120	3		30	A
cis-Chlordane	68		70		50-120	2		30	A
Dieldrin	77		79		50-120	3		30	A
Endrin	72		75		50-120	3		30	A
4,4'-DDT	76		79		50-120	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	55		56		30-150	A
BZ 198	63		63		30-150	A
DBOB	59		57		30-150	B
BZ 198	65		66		30-150	B

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03 Batch: WG1173904-2 WG1173904-3									
Heptachlor epoxide	76		73		50-120	4		30	B
Endosulfan II	81		84		50-120	3		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	55		56		30-150	A
BZ 198	63		63		30-150	A
DBOB	59		57		30-150	B
BZ 198	65		66		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 02-03 Batch: WG1177505-2 WG1177505-3									
gamma-BHC	91		88		50-120	3		30	A
Heptachlor	97		94		50-120	4		30	A
Aldrin	103		100		50-120	3		30	A
Chloropyrifos	96		88		50-120	9		30	A
trans-Chlordane	106		100		50-120	6		30	A
Endosulfan I	104		100		50-120	4		30	A
cis-Chlordane	99		96		50-120	3		30	A
Dieldrin	109		109		50-120	0		30	A
Endrin	102		99		50-120	3		30	A
4,4'-DDT	85		85		50-120	0		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	97		95		30-150	A
BZ 198	81		78		30-150	A
DBOB	90		88		30-150	B
BZ 198	88		85		30-150	B



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 02-03 Batch: WG1177505-2 WG1177505-3									
Heptachlor epoxide	95		95		50-120	0		30	B
Endosulfan II	87		85		50-120	2		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	97		95		30-150	A
BZ 198	81		78		30-150	A
DBOB	90		88		30-150	B
BZ 198	88		85		30-150	B

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173904-5 WG1173904-6 QC Sample: L1843374-01 Client ID: NHH-CLDS													
gamma-BHC	ND	0.103	0.0515	50		0.0629	61		50-120	20		30	A
Heptachlor	ND	0.103	0.0380	37	Q	0.0509	49	Q	50-120	29		30	A
Aldrin	ND	0.103	0.0337	33	Q	0.0451	44	Q	50-120	29		30	A
Chloropyrifos	ND	0.103	0.0573	56		0.0629	61		50-120	9		30	A
Heptachlor epoxide	ND	0.103	0.0723	70		0.0829	80		50-120	14		30	B
trans-Chlordane	ND	0.103	0.0640	62		0.0770	75		50-120	18		30	A
Endosulfan I	ND	0.103	0.0637	62		0.0761	74		50-120	18		30	A
cis-Chlordane	ND	0.103	0.0603	58		0.0726	70		50-120	19		30	A
Dieldrin	ND	0.103	0.0783	76		0.0941	91		50-120	18		30	B
Endrin	ND	0.103	0.0672	65		0.0794	77		50-120	17		30	A
Endosulfan II	ND	0.103	0.0744	72		0.0887	86		50-120	18		30	B
4,4'-DDT	ND	0.103	0.0663	64		0.0797	77		50-120	18		30	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
BZ 198	44		48		30-150	A
DBOB	42		51		30-150	A
BZ 198	47		51		30-150	B
DBOB	44		50		30-150	B



Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1173904-4 QC Sample: L1843374-01 Client ID: NHH-CLDS						
gamma-BHC	ND	ND	ug/l	NC		30 A
Heptachlor	ND	ND	ug/l	NC		30 A
Aldrin	ND	ND	ug/l	NC		30 A
Chloropyrifos	ND	ND	ug/l	NC		30 A
Heptachlor epoxide	ND	ND	ug/l	NC		30 B
trans-Chlordane	ND	ND	ug/l	NC		30 A
Endosulfan I	ND	ND	ug/l	NC		30 A
cis-Chlordane	ND	ND	ug/l	NC		30 A
Dieldrin	ND	ND	ug/l	NC		30 B
Endrin	ND	ND	ug/l	NC		30 A
Endosulfan II	ND	ND	ug/l	NC		30 A
4,4'-DDT	ND	ND	ug/l	NC		30 A
Toxaphene	ND	ND	ug/l	NC		30 A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	44		49		30-150	A
BZ 198	45		54		30-150	A
DBOB	51		52		30-150	B
BZ 198	47		58		30-150	B



METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-01

Date Collected: 10/23/18 13:12

Client ID: NHH-CLDS

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00066		mg/l	0.00050	0.00005	1	11/15/18 09:22	11/15/18 17:00	NA	86,1632A(M)	BV
Cadmium, Total	0.00008		mg/l	0.00004	0.00001	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Chromium, Total	0.00019		mg/l	0.00010	0.00003	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Copper, Total	0.00085		mg/l	0.00030	0.00007	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Lead, Total	0.00073		mg/l	0.00020	0.00006	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/15/18 10:25	11/15/18 13:17	EPA 7474	1,7474	BV
Nickel, Total	0.00070		mg/l	0.00040	0.00011	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/15/18 09:58	11/15/18 16:04	NA	86,1632A(M)	BV
Silver, Total	0.00011		mg/l	0.00008	0.00003	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM
Zinc, Total	0.00140	J	mg/l	0.00200	0.00068	10	11/07/18 08:30	11/14/18 16:55	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-02

Date Collected: 10/23/18 12:50

Client ID: CLDS-WATER-EB

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	ND		mg/l	0.00050	0.00005	1	11/15/18 09:22	11/15/18 17:08	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Chromium, Total	ND		mg/l	0.00050	0.00017	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Copper, Total	ND		mg/l	0.00100	0.00038	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/15/18 10:25	11/15/18 13:27	EPA 7474	1,7474	BV
Nickel, Total	ND		mg/l	0.00200	0.00055	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/15/18 09:58	11/15/18 16:12	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00040	0.00016	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/14/18 08:30	11/14/18 16:27	EPA 3005A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-03

Date Collected: 10/23/18 12:20

Client ID: CLDS-GRAB-EB

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	ND		mg/l	0.00050	0.00005	1	11/15/18 09:22	11/15/18 17:10	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Chromium, Total	0.00064		mg/l	0.00050	0.00017	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Copper, Total	0.00048	J	mg/l	0.00100	0.00038	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/15/18 10:25	11/15/18 13:29	EPA 7474	1,7474	BV
Nickel, Total	0.00080	J	mg/l	0.00200	0.00055	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Selenium, Total	0.00024	J	mg/l	0.00056	0.00009	1	11/15/18 09:58	11/15/18 16:14	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00040	0.00016	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/14/18 08:30	11/14/18 16:32	EPA 3005A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1176966-1										
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Chromium, Total	0.00009	J	mg/l	0.00010	0.00003	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Copper, Total	0.00023	J	mg/l	0.00030	0.00007	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Lead, Total	0.00010	J	mg/l	0.00020	0.00006	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Nickel, Total	0.00016	J	mg/l	0.00040	0.00011	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM
Zinc, Total	0.00554		mg/l	0.00200	0.00068	10	11/07/18 08:30	11/14/18 15:55	1,6020B	AM

Prep Information

Digestion Method: CHELATION

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 02-03 Batch: WG1179256-1										
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Chromium, Total	ND		mg/l	0.00050	0.00017	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Copper, Total	ND		mg/l	0.00100	0.00038	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Nickel, Total	ND		mg/l	0.00200	0.00055	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Silver, Total	ND		mg/l	0.00040	0.00016	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/14/18 08:30	11/14/18 15:50	1,6020B	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1179725-1										
Arsenic, Total	ND		mg/l	0.00050	0.00005	1	11/15/18 09:22	11/15/18 16:56	86,1632A(M)	BV



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method:

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1179736-1									
Mercury, Total	ND	mg/l	0.00005	0.00001	1	11/15/18 10:25	11/15/18 13:12	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1179754-1									
Selenium, Total	ND	mg/l	0.00056	0.00009	1	11/15/18 09:58	11/15/18 16:00	86,1632A(M)	BV

Prep Information

Digestion Method:



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1176966-2								
Cadmium, Total	16	Q	-		80-120	-		20
Chromium, Total	06	Q	-		80-120	-		20
Copper, Total	13	Q	-		80-120	-		20
Lead, Total	17	Q	-		80-120	-		20
Nickel, Total	12	Q	-		80-120	-		20
Silver, Total	01	Q	-		80-120	-		20
Zinc, Total	16	Q	-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 02-03 Batch: WG1179256-2								
Cadmium, Total	108		-		80-120	-		20
Chromium, Total	98		-		80-120	-		20
Copper, Total	100		-		80-120	-		20
Lead, Total	109		-		80-120	-		20
Nickel, Total	100		-		80-120	-		20
Silver, Total	105		-		80-120	-		20
Zinc, Total	107		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1179725-2 SRM Lot Number: A2HGAF								
Arsenic, Total	96		-		80-120	-		20



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1179736-2 SRM Lot Number: HPHGAF					
Mercury, Total	103	-	80-120	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1179754-2 SRM Lot Number: A2HGAF					
Selenium, Total	103	-	80-120	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1176966-3 QC Sample: L1843374-01 Client ID: NHH-CLDS												
Cadmium, Total	0.00008	0.051	0.00773	15	Q	-	-		75-125	-		20
Chromium, Total	0.00019	0.2	0.00285	1	Q	-	-		75-125	-		20
Copper, Total	0.00085	0.25	0.0327	13	Q	-	-		75-125	-		20
Lead, Total	0.00073	0.51	0.0883	17	Q	-	-		75-125	-		20
Nickel, Total	0.00070	0.5	0.05866	12	Q	-	-		75-125	-		20
Silver, Total	0.00011	0.05	0.00109	2	Q	-	-		75-125	-		20
Zinc, Total	0.00140J	0.5	0.0732	15	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 02-03 QC Batch ID: WG1179256-3 QC Sample: L1843374-02 Client ID: CLDS-WATER-EB												
Cadmium, Total	ND	0.051	0.05641	111		-	-		75-125	-		20
Chromium, Total	ND	0.2	0.204	102		-	-		75-125	-		20
Copper, Total	ND	0.25	0.263	105		-	-		75-125	-		20
Lead, Total	ND	0.51	0.574	112		-	-		75-125	-		20
Nickel, Total	ND	0.5	0.5116	102		-	-		75-125	-		20
Silver, Total	ND	0.05	0.05400	108		-	-		75-125	-		20
Zinc, Total	ND	0.5	0.553	111		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179725-3 WG1179725-4 QC Sample: L1843374-01 Client ID: NHH-CLDS												
Arsenic, Total	0.00066	0.005	0.00491	85		0.00572	101		75-125	15		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179736-3 WG1179736-4 QC Sample: L1843374-01 Client ID: NHH-CLDS												
Mercury, Total	ND	0.0025	0.00238	95		0.00235	94		80-120	1		20

Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843374

Project Number: 60588790 TASK 6.0

Report Date: 11/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179754-3 WG1179754-4 QC Sample: L1843374-01 Client ID: NHH-CLDS									
Selenium, Total	ND	0.00556	0.00574	103	0.00566	102	75-125	1	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843374

Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1176966-4 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Cadmium, Total	0.00008	0.00002J	mg/l	NC		20
Chromium, Total	0.00019	0.00019	mg/l	1		20
Copper, Total	0.00085	0.00082	mg/l	3		20
Lead, Total	0.00073	0.00016J	mg/l	NC		20
Nickel, Total	0.00070	0.00042	mg/l	49	Q	20
Silver, Total	0.00011	ND	mg/l	NC		20
Zinc, Total	0.00140J	0.00124J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 02-03 QC Batch ID: WG1179256-4 QC Sample: L1843374-02 Client ID: CLDS-WATER-EB						
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	0.00018J	mg/l	NC		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179725-5 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Arsenic, Total	0.00066	0.00073	mg/l	10		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179736-5 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Mercury, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843374

Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1179754-5 QC Sample: L1843374-01 Client ID: NHH-CLDS					
Selenium, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-01

Date Collected: 10/23/18 13:12

Client ID: NHH-CLDS

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/25/18 03:00	10/25/18 03:40	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-02

Date Collected: 10/23/18 12:50

Client ID: CLDS-WATER-EB

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/25/18 03:00	10/25/18 03:42	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**SAMPLE RESULTS**

Lab ID: L1843374-03

Date Collected: 10/23/18 12:20

Client ID: CLDS-GRAB-EB

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/25/18 03:00	10/25/18 03:42	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENT.
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1172040-1									
Chromium, Hexavalent	ND	mg/l	0.010	0.003	1	10/25/18 03:00	10/25/18 03:39	121,3500CR-B	MA



Lab Control Sample Analysis**Batch Quality Control****Project Name:** NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1172040-2								
Chromium, Hexavalent	98		-		85-115	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1172040-4 WG1172040-5 QC Sample: L1843374-01 Client ID: NHH-CLDS												
Chromium, Hexavalent	ND	0.1	0.097	97		0.099	99		85-115	2		20



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843374

Report Date: 11/15/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1172040-3 QC Sample: L1843374-01 Client ID: NHH-CLDS						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Serial_No:11151819:02
Lab Number: L1843374
Report Date: 11/15/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843374-01A	Plastic 250ml unpreserved	B	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843374-01B	Plastic 250ml unpreserved	B	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843374-01C	Plastic 250ml unpreserved	B	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843374-01D	Plastic 500ml HNO3 preserved	B	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843374-01E	Plastic 500ml HNO3 preserved	B	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843374-01F	Plastic 500ml HNO3 preserved	B	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843374-01G	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01H	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01I	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01J	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01K	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01L	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-01M	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-01N	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-01O	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843374**Project Number:** 60588790 TASK 6.0**Report Date:** 11/15/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843374-01P	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-01Q	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-01R	Amber 1000ml unpreserved	B	7	7	3.6	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-02A	Plastic 250ml unpreserved	C	7	7	2.0	Y	Absent		HEXCR-3500(1)
L1843374-02B	Plastic 500ml HNO3 preserved	C	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843374-02C	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-02D	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-02E	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-02F	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-03A	Plastic 250ml unpreserved	C	7	7	2.0	Y	Absent		HEXCR-3500(1)
L1843374-03B	Plastic 500ml HNO3 preserved	C	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843374-03C	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-03D	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-8270(7),A2-RIM-PCBCONG-8270(7)
L1843374-03E	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843374-03F	Amber 1000ml unpreserved	C	7	7	2.0	Y	Absent		A2-RIM-PEST-ELUT(7)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843374
Report Date: 11/15/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 86 Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry. USEPA Office of Water, EPA Method 1632, Revision A, August 1998.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	No – see narrative
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	N/A
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No – see narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No – see narrative
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	No – see narrative





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	



Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	No	Pentachlorophenol 27.3%	Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	WG1174496-1: cis-nonachlor (18.1%D A channel), hexachlorobenzene (17.3%D B channel), heptachlor (16.1%D B channel), chloropyrifus (18.8%D B channel), 4,4'-DDT (18.8%D B channel), WG1174496-2: cis-nonachlor (19.7% B channel)	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	No	L1843374-02: BZ198 29%/29% L1843374-03: BZ198 24%/23%, DBOB 26% column B	In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	CCV associated with all samples: C12-BZ#8 @ 16%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	N/A		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	N/A		In Data Package
Method Blank	No target analytes > RL	No	WG1176966-1 Zn	In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	No	WG1176966-3 MS Cd(15%), Cr(1%), Cu(13%), Pb(17%), Ni(12%), Ag(2%), Zn(15%)	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	WG1176966-4 Ni(49%)	In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd In Lab: 10/24/18

ALPHA Job #: 61843374

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: New Haven Harbor/CLDS
Project Location: CENTRAL LI DISPOSAL SITE
Project #: 60588790
Project Manager: K. VAN NAARSSEN
ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client Info PO #:

Client Information

Client: USACO / AECOM
Address: 500 Enterprise Dr
Rocky Hill, CT
Phone: 484.678.1876
Email: Kris.VanNaarsse@AECOM.com
Additional Project Information:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)
Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program ITM / RIM Criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
<u>43374-01</u>	<u>NHH-CLDS</u>	<u>10/23/18</u>	<u>1312</u>	<u>W</u>	<u>KVN</u>
<u>02</u>	<u>CLDS-WATER-EPB</u>	<u>10/23/18</u>	<u>1250</u>	<u>W</u>	<u>KVN</u>
<u>03</u>	<u>CLDS-GRAB-SB</u>	<u>10/23/18</u>	<u>1220</u>	<u>W</u>	<u>KVN</u>

ANALYSIS

VOC: 8260 824 524.2
SVOC: ABN PAH
METALS: MCP 13 MCP 14 RCP 15
METALS: RCRA 5 RCRA 8 PPT 13
EPH: Ranges & Targets Ranges Only
VPH: Ranges & Targets Ranges Only
 PCB PEST
TPH: Quant Only Fingerprinting

SAMPLE INFO

Filtration
 Field Lab to do
Preservation
 Lab to do

Handwritten notes: SUCs, RIM PESTICIDES, HMX CHLORAM, PCBs, RIM CAN CENTERS, TOTAL METALS, TOTAL METALS, TOTAL METALS

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - E= Encore
 - D= BOD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO₃
 - D= H₂SO₄
 - E= NaOH
 - F= MeOH
 - G= NaHSO₄
 - H= Na₂S₂O₈
 - I= Ascorbic Acid
 - J= NH₄Cl
 - K= Zn Acetate
 - Q= Other

Container Type	<u>P</u> <u>A</u> <u>P</u> <u>A</u> <u>P</u> <u>P</u>
Preservative	<u>A</u> <u>D</u> <u>A</u> <u>A</u> <u>A</u> <u>C</u>

Relinquished By:	Date/Time	Received By:	Date/Time
<u>[Signature]</u>	<u>10/23/18 12:15</u>	<u>[Signature]</u>	<u>10/23/18 17:15</u>
<u>[Signature]</u>	<u>10/24/18 13:24</u>	<u>[Signature]</u>	<u>10/24/18 13:03</u>
<u>[Signature]</u>	<u>10/24/18 15:09</u>	<u>[Signature]</u>	<u>10/24/18 18:09</u>

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L1843524
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 6.0
Report Date:	11/12/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1843524-01	PUMP BLANK	WATER	NEW HAVEN, CT	10/24/18 14:20	10/25/18
L1843524-02	CORE BLANK	WATER	NEW HAVEN, CT	10/24/18 14:00	10/25/18

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

PCBs

L1843524-01: The surrogate recovery is outside the individual acceptance criteria for bz 198 (22%), but within the overall method allowances. The results of the original analysis are reported; however, all associated compounds are considered to have a potential bias.

L1843524-02: The surrogate recovery is outside the individual acceptance criteria for bz 198 (26%), but within the overall method allowances. The results of the original analysis are reported; however, all associated compounds are considered to have a potential bias.

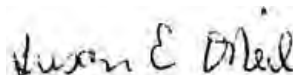
Pesticides

L1843524-01: The surrogate recoveries were outside the acceptance criteria for dbob (20%/17%) and bz 198 (19%/16%); however, the criteria were achieved upon re-extraction outside of holding time. The results of both extractions are reported; however, all associated compounds are considered to have a potential bias.

L1843524-02: The surrogate recoveries were outside the acceptance criteria for dbob (20%/20%) and bz 198 (21%/20%); however, the criteria were achieved upon re-extraction outside of holding time. The results of both extractions are reported; however, all associated compounds are considered to have a potential bias.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 11/12/18

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-01
 Client ID: PUMP BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 13:29
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.22	0.484	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	72		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-02
 Client ID: CORE BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:00
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 14:00
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.02	0.440	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	65		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843524**Project Number:** 60588790 TASK 6.0**Report Date:** 11/12/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
 Analytical Date: 11/09/18 11:57
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 19:00

Parameter	Result	Qualifier	Units	RL	MDL
RIM Semivolatile Organics by GC/MS - Mansfield Lab for sample(s): 01-02 Batch: WG1173998-1					
Pentachlorophenol	ND		ug/l	2.00	0.436

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	93		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-02 Batch: WG1173998-2 WG1173998-3								
Pentachlorophenol	77		78		50-120	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,6-Tribromophenol	95		93		30-150

PCBS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-01
 Client ID: PUMP BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/10/18 18:31
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.0010	0.0005	1
CI3-BZ#18	ND		ug/l	0.0010	0.0005	1
CI3-BZ#28	ND		ug/l	0.0010	0.0005	1
CI4-BZ#44	ND		ug/l	0.0010	0.0005	1
CI4-BZ#49	ND		ug/l	0.0010	0.0005	1
CI4-BZ#52	ND		ug/l	0.0010	0.0005	1
CI4-BZ#66	ND		ug/l	0.0010	0.0005	1
CI5-BZ#87	ND		ug/l	0.0010	0.0005	1
CI5-BZ#101	ND		ug/l	0.0010	0.0005	1
CI5-BZ#105	ND		ug/l	0.0010	0.0005	1
CI5-BZ#118	ND		ug/l	0.0010	0.0005	1
CI6-BZ#128	ND		ug/l	0.0010	0.0005	1
CI6-BZ#138	ND		ug/l	0.0010	0.0005	1
CI6-BZ#153	ND		ug/l	0.0010	0.0005	1
CI7-BZ#170	ND		ug/l	0.0010	0.0005	1
CI7-BZ#180	ND		ug/l	0.0010	0.0005	1
CI7-BZ#183	ND		ug/l	0.0010	0.0005	1
CI7-BZ#184	ND		ug/l	0.0010	0.0005	1
CI7-BZ#187	ND		ug/l	0.0010	0.0005	1
CI8-BZ#195	ND		ug/l	0.0010	0.0005	1
CI9-BZ#206	ND		ug/l	0.0010	0.0005	1
CI10-BZ#209	ND		ug/l	0.0010	0.0005	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	31		30-150
BZ 198	22	Q	30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-02
 Client ID: CORE BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:00
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/10/18 19:04
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.0010	0.0005	1
CI3-BZ#18	ND		ug/l	0.0010	0.0005	1
CI3-BZ#28	ND		ug/l	0.0010	0.0005	1
CI4-BZ#44	ND		ug/l	0.0010	0.0005	1
CI4-BZ#49	ND		ug/l	0.0010	0.0005	1
CI4-BZ#52	ND		ug/l	0.0010	0.0005	1
CI4-BZ#66	ND		ug/l	0.0010	0.0005	1
CI5-BZ#87	ND		ug/l	0.0010	0.0005	1
CI5-BZ#101	ND		ug/l	0.0010	0.0005	1
CI5-BZ#105	ND		ug/l	0.0010	0.0005	1
CI5-BZ#118	ND		ug/l	0.0010	0.0005	1
CI6-BZ#128	ND		ug/l	0.0010	0.0005	1
CI6-BZ#138	ND		ug/l	0.0010	0.0005	1
CI6-BZ#153	ND		ug/l	0.0010	0.0005	1
CI7-BZ#170	ND		ug/l	0.0010	0.0005	1
CI7-BZ#180	ND		ug/l	0.0010	0.0005	1
CI7-BZ#183	ND		ug/l	0.0010	0.0005	1
CI7-BZ#184	ND		ug/l	0.0010	0.0005	1
CI7-BZ#187	ND		ug/l	0.0010	0.0005	1
CI8-BZ#195	ND		ug/l	0.0010	0.0005	1
CI9-BZ#206	ND		ug/l	0.0010	0.0005	1
CI10-BZ#209	ND		ug/l	0.0010	0.0005	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	32		30-150
BZ 198	26	Q	30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 11/10/18 13:27
Analyst: GP

Extraction Method: EPA 3510C
Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL
PCB Congeners (RIM List) - Mansfield Lab for sample(s): 01-02 Batch: WG1173900-1					
C12-BZ#8	ND		ug/l	0.0010	0.0005
C13-BZ#18	ND		ug/l	0.0010	0.0005
C13-BZ#28	ND		ug/l	0.0010	0.0005
C14-BZ#44	ND		ug/l	0.0010	0.0005
C14-BZ#49	ND		ug/l	0.0010	0.0005
C14-BZ#52	ND		ug/l	0.0010	0.0005
C14-BZ#66	ND		ug/l	0.0010	0.0005
C15-BZ#87	ND		ug/l	0.0010	0.0005
C15-BZ#101	ND		ug/l	0.0010	0.0005
C15-BZ#105	ND		ug/l	0.0010	0.0005
C15-BZ#118	ND		ug/l	0.0010	0.0005
C16-BZ#128	ND		ug/l	0.0010	0.0005
C16-BZ#138	ND		ug/l	0.0010	0.0005
C16-BZ#153	ND		ug/l	0.0010	0.0005
C17-BZ#170	ND		ug/l	0.0010	0.0005
C17-BZ#180	ND		ug/l	0.0010	0.0005
C17-BZ#183	ND		ug/l	0.0010	0.0005
C17-BZ#184	ND		ug/l	0.0010	0.0005
C17-BZ#187	ND		ug/l	0.0010	0.0005
C18-BZ#195	ND		ug/l	0.0010	0.0005
C19-BZ#206	ND		ug/l	0.0010	0.0005
C110-BZ#209	ND		ug/l	0.0010	0.0005

Surrogate	%Recovery	Qualifier	Acceptance Criteria
DBOB	105		30-150
BZ 198	98		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-02 Batch: WG1173900-2 WG1173900-3								
Cl2-BZ#8	75		76		50-120	1		30
Cl3-BZ#18	77		77		50-120	0		30
Cl3-BZ#28	82		80		50-120	2		30
Cl4-BZ#44	88		88		50-120	0		30
Cl4-BZ#49	88		85		50-120	3		30
Cl4-BZ#52	84		83		50-120	1		30
Cl4-BZ#66	89		86		50-120	3		30
Cl5-BZ#87	92		89		50-120	3		30
Cl5-BZ#101	93		89		50-120	4		30
Cl5-BZ#105	94		92		50-120	2		30
Cl5-BZ#118	91		88		50-120	3		30
Cl6-BZ#128	90		87		50-120	3		30
Cl6-BZ#138	92		89		50-120	3		30
Cl6-BZ#153	91		87		50-120	4		30
Cl7-BZ#170	92		87		50-120	6		30
Cl7-BZ#180	88		85		50-120	3		30
Cl7-BZ#183	87		83		50-120	5		30
Cl7-BZ#184	92		87		50-120	6		30
Cl7-BZ#187	87		84		50-120	4		30
Cl8-BZ#195	97		92		50-120	5		30
Cl9-BZ#206	96		93		50-120	3		30
Cl10-BZ#209	93		90		50-120	3		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-02 Batch: WG1173900-2 WG1173900-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
DBOB	96		100		30-150
BZ 198	92		85		30-150



PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-01
 Client ID: PUMP BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 10/31/18 20:56
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0255	0.0127	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	17	Q	30-150	A
BZ 198	18	Q	30-150	A
DBOB	20	Q	30-150	B
BZ 198	19	Q	30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-01 RE
 Client ID: PUMP BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/12/18 14:08
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	0.0009	P	ug/l	0.0004	0.0004	1	B
Dieldrin	ND	I	ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0247	0.0123	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	87		30-150	A
BZ 198	53		30-150	A
DBOB	78		30-150	B
BZ 198	58		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-02
 Client ID: CORE BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:00
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 10/31/18 21:30
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Dieldrin	ND		ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0238	0.0119	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	20	Q	30-150	A
BZ 198	20	Q	30-150	A
DBOB	20	Q	30-150	B
BZ 198	21	Q	30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

SAMPLE RESULTS

Lab ID: L1843524-02 RE
 Client ID: CORE BLANK
 Sample Location: NEW HAVEN, CT

Date Collected: 10/24/18 14:00
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/12/18 14:42
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Dieldrin	ND	IP	ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0242	0.0121	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	A
BZ 198	67		30-150	A
DBOB	84		30-150	B
BZ 198	71		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
 Analytical Date: 10/31/18 15:50
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 10/30/18 14:30

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-02 Batch: WG1173904-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Endosulfan I	ND		ug/l	0.0005	0.0005	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	58		30-150	A
BZ 198	63		30-150	A
DBOB	64		30-150	B
BZ 198	65		30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8081B
Analytical Date: 11/12/18 12:26
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 11/08/18 17:00

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-02 Batch: WG1177505-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B
Endosulfan I	ND		ug/l	0.0005	0.0005	B
cis-Chlordane	ND		ug/l	0.0005	0.0005	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	A
BZ 198	82		30-150	A
DBOB	86		30-150	B
BZ 198	89		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-02 Batch: WG1173904-2 WG1173904-3									
gamma-BHC	55		56		50-120	3		30	A
Heptachlor	61		63		50-120	3		30	A
Aldrin	63		65		50-120	2		30	A
Chloropyrifos	53		58		50-120	8		30	A
trans-Chlordane	73		75		50-120	2		30	A
Endosulfan I	70		71		50-120	3		30	A
cis-Chlordane	68		70		50-120	2		30	A
Dieldrin	77		79		50-120	3		30	A
Endrin	72		75		50-120	3		30	A
4,4'-DDT	76		79		50-120	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	55		56		30-150	A
BZ 198	63		63		30-150	A
DBOB	59		57		30-150	B
BZ 198	65		66		30-150	B

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-02 Batch: WG1173904-2 WG1173904-3									
Heptachlor epoxide	76		73		50-120	4		30	B
Endosulfan II	81		84		50-120	3		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	55		56		30-150	A
BZ 198	63		63		30-150	A
DBOB	59		57		30-150	B
BZ 198	65		66		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-02 Batch: WG1177505-2 WG1177505-3									
gamma-BHC	91		88		50-120	3		30	A
Heptachlor	97		94		50-120	4		30	A
Aldrin	103		100		50-120	3		30	A
Chloropyrifos	96		88		50-120	9		30	A
trans-Chlordane	106		100		50-120	6		30	A
Endosulfan I	104		100		50-120	4		30	A
cis-Chlordane	99		96		50-120	3		30	A
Dieldrin	109		109		50-120	0		30	A
Endrin	102		99		50-120	3		30	A
4,4'-DDT	85		85		50-120	0		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	97		95		30-150	A
BZ 198	81		78		30-150	A
DBOB	90		88		30-150	B
BZ 198	88		85		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-02 Batch: WG1177505-2 WG1177505-3									
Heptachlor epoxide	95		95		50-120	0		30	B
Endosulfan II	87		85		50-120	2		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	97		95		30-150	A
BZ 198	81		78		30-150	A
DBOB	90		88		30-150	B
BZ 198	88		85		30-150	B



METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843524**Project Number:** 60588790 TASK 6.0**Report Date:** 11/12/18**SAMPLE RESULTS**

Lab ID: L1843524-01

Date Collected: 10/24/18 14:20

Client ID: PUMP BLANK

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	ND		mg/l	0.00100	0.00009	1	11/08/18 08:18	11/08/18 13:01	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Chromium, Total	ND		mg/l	0.00050	0.00017	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Copper, Total	ND		mg/l	0.00100	0.00038	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/07/18 17:52	11/08/18 10:10	EPA 7474	1,7474	BV
Nickel, Total	ND		mg/l	0.00200	0.00055	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/08/18 08:38	11/08/18 14:05	NA	86,1632A(M)	BV
Silver, Total	0.00050	J	mg/l	0.00200	0.00016	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/06/18 10:22	11/06/18 17:03	EPA 3005A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843524**Project Number:** 60588790 TASK 6.0**Report Date:** 11/12/18**SAMPLE RESULTS**

Lab ID: L1843524-02

Date Collected: 10/24/18 14:00

Client ID: CORE BLANK

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	ND		mg/l	0.00100	0.00009	1	11/08/18 08:18	11/08/18 13:08	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Chromium, Total	ND		mg/l	0.00050	0.00017	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Copper, Total	ND		mg/l	0.00100	0.00038	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/07/18 17:52	11/08/18 10:17	EPA 7474	1,7474	BV
Nickel, Total	ND		mg/l	0.00200	0.00055	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/08/18 08:38	11/08/18 13:59	NA	86,1632A(M)	BV
Silver, Total	0.00016	J	mg/l	0.00200	0.00016	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/06/18 10:22	11/06/18 17:07	EPA 3005A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1176376-1										
Cadmium, Total	ND		mg/l	0.00020	0.00005	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Chromium, Total	ND		mg/l	0.00050	0.00017	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Copper, Total	ND		mg/l	0.00100	0.00038	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Lead, Total	ND		mg/l	0.00100	0.00034	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Nickel, Total	ND		mg/l	0.00200	0.00055	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Silver, Total	0.00036	J	mg/l	0.00200	0.00016	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM
Zinc, Total	ND		mg/l	0.0100	0.00341	1	11/06/18 10:22	11/06/18 16:59	1,6020B	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1177111-1										
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/07/18 17:52	11/08/18 10:05	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1177273-1										
Arsenic, Total	ND		mg/l	0.00100	0.00009	1	11/08/18 08:18	11/08/18 12:56	86,1632A(M)	BV

Prep Information

Digestion Method:



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1177277-1										
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/08/18 08:38	11/08/18 13:55	86,1632A(M)	BV

Prep Information

Digestion Method:



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1176376-2								
Cadmium, Total	114		-		80-120	-		20
Chromium, Total	96		-		80-120	-		20
Copper, Total	96		-		80-120	-		20
Lead, Total	110		-		80-120	-		20
Nickel, Total	98		-		80-120	-		20
Silver, Total	117		-		80-120	-		20
Zinc, Total	106		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1177111-2 SRM Lot Number: HPHGAF								
Mercury, Total	83		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1177273-2 SRM Lot Number: A2HGAF								
Arsenic, Total	89		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1177277-2 SRM Lot Number: A2HGAF								
Selenium, Total	105		-		80-120	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1176376-3 QC Sample: L1843046-01 Client ID: MS Sample												
Cadmium, Total	ND	0.051	0.05632	110		-	-		75-125	-		20
Chromium, Total	ND	0.2	0.198	99		-	-		75-125	-		20
Copper, Total	ND	0.25	0.253	101		-	-		75-125	-		20
Lead, Total	ND	0.51	0.564	110		-	-		75-125	-		20
Nickel, Total	ND	0.5	0.5071	101		-	-		75-125	-		20
Silver, Total	0.00017J	0.05	0.05795	116		-	-		75-125	-		20
Zinc, Total	ND	0.5	0.559	112		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177111-3 QC Sample: L1843524-01 Client ID: PUMP BLANK												
Mercury, Total	ND	0.0025	0.00250	100		-	-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177273-3 QC Sample: L1843524-01 Client ID: PUMP BLANK												
Arsenic, Total	ND	0.01	0.00970	97		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177277-3 QC Sample: L1843524-02 Client ID: CORE BLANK												
Selenium, Total	ND	0.00556	0.00552	99		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843524

Report Date: 11/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1176376-4 QC Sample: L1843046-01 Client ID: DUP Sample						
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	ND	0.00052J	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	0.00017J	0.00023J	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177111-4 QC Sample: L1843524-01 Client ID: PUMP BLANK						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177273-4 QC Sample: L1843524-01 Client ID: PUMP BLANK						
Arsenic, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1177277-4 QC Sample: L1843524-02 Client ID: CORE BLANK						
Selenium, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843524**Project Number:** 60588790 TASK 6.0**Report Date:** 11/12/18**SAMPLE RESULTS**

Lab ID: L1843524-01

Date Collected: 10/24/18 14:20

Client ID: PUMP BLANK

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/25/18 11:45	10/25/18 12:02	121,3500CR-B	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843524**Project Number:** 60588790 TASK 6.0**Report Date:** 11/12/18**SAMPLE RESULTS**

Lab ID: L1843524-02

Date Collected: 10/24/18 14:00

Client ID: CORE BLANK

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/25/18 11:45	10/25/18 12:02	121,3500CR-B	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1172223-1									
Chromium, Hexavalent	ND	mg/l	0.010	0.003	1	10/25/18 11:45	10/25/18 12:00	121,3500CR-B	GD



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1172223-2								
Chromium, Hexavalent	96		-		85-115	-		20



Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843524

Project Number: 60588790 TASK 6.0

Report Date: 11/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1172223-4 QC Sample: L1843524-02 Client ID: CORE BLANK												
Chromium, Hexavalent	ND	0.1	0.094	94		-	-		85-115	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843524

Report Date: 11/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1172223-3 QC Sample: L1843524-02 Client ID: CORE BLANK						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Serial_No:11121817:14
Lab Number: L1843524
Report Date: 11/12/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843524-01A	Plastic 500ml unpreserved	A	7	7	3.2	Y	Absent		HEXCR-3500(1)
L1843524-01B	Plastic 500ml HNO3 preserved	A	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843524-01C	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843524-01D	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843524-01E	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843524-01F	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1843524-02A	Plastic 500ml unpreserved	A	7	7	3.2	Y	Absent		HEXCR-3500(1)
L1843524-02B	Plastic 500ml HNO3 preserved	A	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843524-02C	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843524-02D	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843524-02E	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843524-02F	Amber 1000ml unpreserved	A	7	7	3.2	Y	Absent		A2-RIM-8270(7)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
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GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
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Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843524
Report Date: 11/12/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 86 Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry. USEPA Office of Water, EPA Method 1632, Revision A, August 1998.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	Yes
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	Yes
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	Yes
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	No – see narrative





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	



Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	no	Pentachlorophenol 27.3%	Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	NA		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	WG1174496-1: cis-nonachlor (18.1%D A channel), hexachlorobenzene (17.3%D B channel), heptachlor (16.1%D B channel), chloropyrifus (18.8%D B channel), 4,4'-DDT (18.8%D B channel), WG1174496-2: cis-nonachlor (19.7% B channel)	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	NA		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	No	L1843524-01: DBOB (17% and 20%), BZ 198 (18% and 19%) L1843524-02: DBOB (20% and 20%), BZ 198 (20% and 21%)	In Data Package





* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	CCV associated with all samples: C12-BZ#8 @ 16%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	NA		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	No	L1843524-01: BZ198 @ 22% L1843524-02: BZ198 @ 26%	In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	N/A		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	N/A		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





CHAIN OF CUSTODY

PAGE _____ OF _____

Date Rec'd in Lab: 10/25/18

ALPHA Job #: L1843524

9 Walkup Drive
Westboro, MA 01581
Tel: 508-898-6220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: NEW HAVEN HARBOR
Project Location: NEW HAVEN, CT
Project #: _____
Project Manager: RICHARD LOYD / KRIS VAN NERSSON
ALPHA Quote #: _____

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #: _____

Client Information

Client: USACE/ARCOM
Address: 696 VIRGINIA RD
CONCORD, MA 01742
Phone: 9783188048
Email: RICHARD.B.LOYD@USACE.ARMY.MIL

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)
Date Due: _____

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program PDM Criteria REM

Additional Project Information:

ANALYSIS	VOC: <input type="checkbox"/> 8280 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15	METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPT3	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB: <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	TOTAL METALS, HG	HEX CR	PCB CONGENERS	PESTICIDES	ADM SVCS	SAMPLE INFO	TOTAL # BOTTLES
														Filtration	6
														<input type="checkbox"/> Field	
														Preservation	6
														<input type="checkbox"/> Lab to do	
														Sample Comments	

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
43524-01	PUMP BLANK	10/24	1420	DI	GJS
02	CORE BLANK	10/24	1400	DI	GJS

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₃
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type	P	P	A	A	A
Preservative	C	A	A	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	10/24 1545	<i>[Signature]</i>	10/24/18
<i>[Signature]</i>	10/25 0645	<i>[Signature]</i>	10/25/18 0645

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L1843759
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 6.0
Report Date:	11/20/18

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Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1843759-01	COMPOSITE 1 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-02	COMPOSITE 1 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-03	COMPOSITE 1 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-04	COMPOSITE 2 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-05	COMPOSITE 2 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-06	COMPOSITE 2 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/25/18 10:55	10/25/18
L1843759-07	COMPOSITE 6 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/25/18 11:30	10/25/18
L1843759-08	COMPOSITE 6 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/25/18 11:30	10/25/18
L1843759-09	COMPOSITE 6 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/25/18 11:30	10/25/18
L1843759-10	COMPOSITE 1 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/25/18 13:10	10/25/18
L1843759-11	COMPOSITE 1 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/25/18 13:10	10/25/18
L1843759-12	COMPOSITE 1 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/25/18 13:10	10/25/18
L1843759-13	COMPOSITE 2 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/25/18 14:05	10/25/18
L1843759-14	COMPOSITE 2 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/25/18 14:05	10/25/18
L1843759-15	COMPOSITE 2 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/25/18 14:05	10/25/18
L1843759-16	COMPOSITE 6 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/25/18 15:20	10/25/18
L1843759-17	COMPOSITE 6 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/25/18 15:20	10/25/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1843759-18	COMPOSITE 6 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/25/18 15:20	10/25/18



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L1843759-09 : A sample identified as "COMPOSITE 6 ELUTRIATE BLANK-REP3" was received but not listed on the Chain of Custody. At the client's request, this sample was analyzed.

Total Metals

The WG1177004-2 LCS recoveries, associated with L1843759-01 through -18, were below the acceptance criteria for cadmium (75%), chromium (1.5%), copper (60%), lead (73%), nickel (53%), silver (5.4%) and zinc (69%); however, a rerun produced similar results. The results of the original analyses are reported; however, all results are considered to have a potentially low bias for these analytes.

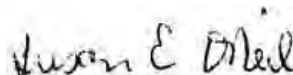
The WG1177004-3 MS recoveries, performed on L1843759-13, are below the acceptance criteria for cadmium (50%), chromium (23%), copper (42%), lead (48%), nickel (27%), silver (22%) and zinc (41%). The results of the native sample are considered to have a potentially low bias for these analytes.

The WG1180829-3 MS recovery for arsenic (74%), performed on L1843759-13, does not apply because the sample concentration is greater than four times the spike amount added.

The WG1177004-5 Laboratory Duplicate RPDs for chromium (62%), lead (26%) and zinc (26%), performed on L1843759-13, are outside the acceptance criteria. The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 11/20/18

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-01
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 20:37
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.02	0.440	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			73		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-02
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 21:08
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.06	0.450	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	81		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-03
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 23:10
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.00	0.436	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	63		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-04
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/09/18 23:40
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.00	0.436	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	78		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-05
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 00:11
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.02	0.440	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			71		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-06
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 00:42
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.10	0.459	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			59		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-07
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 01:12
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.25	0.490	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	63		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-08
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 01:43
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.25	0.490	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	56		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-09
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 02:14
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.13	0.464	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	65		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-10
 Client ID: COMPOSITE 1 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 02:45
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.02	0.440	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	39		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-11
 Client ID: COMPOSITE 1 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 03:15
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.13	0.464	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	32		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-12
 Client ID: COMPOSITE 1 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 03:46
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.02	0.440	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	53		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-13
 Client ID: COMPOSITE 2 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 04:17
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.04	0.445	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	52		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-14
 Client ID: COMPOSITE 2 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 06:19
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.10	0.459	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	63		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-15
 Client ID: COMPOSITE 2 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 06:50
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.13	0.464	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	64		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-16
 Client ID: COMPOSITE 6 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 07:21
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.04	0.445	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	148		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-17
 Client ID: COMPOSITE 6 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 07:51
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.08	0.454	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			65		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-18
 Client ID: COMPOSITE 6 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 08:22
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.04	0.445	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	69		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
 Analytical Date: 11/09/18 14:30
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 12:00

Parameter	Result	Qualifier	Units	RL	MDL
RIM Semivolatile Organics by GC/MS - Mansfield Lab for sample(s): 01-18 Batch: WG1174817-1					
Pentachlorophenol	ND		ug/l	2.00	0.436

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	87		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-18 Batch: WG1174817-2 WG1174817-3								
Pentachlorophenol	87		71		50-120	20		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,6-Tribromophenol	114		95		30-150

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1174817-4 WG1174817-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1												
Pentachlorophenol	ND	10.5	6.15	58		8.07	77		50-120	27		30

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	73		64		30-150

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1174817-6 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1						

Pentachlorophenol	ND	ND	ug/l	NC		30
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Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	52		116		30-150



PCBS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-01
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 05:53
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	76		30-150
BZ 198	87		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-02
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 06:26
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	75		30-150
BZ 198	84		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-03
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 07:00
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	73		30-150
BZ 198	85		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-04
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 07:33
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	71		30-150
BZ 198	81		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-05
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 08:06
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	73		30-150
BZ 198	83		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-06
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 08:40
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	71		30-150
BZ 198	85		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-07
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 09:13
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	70		30-150
BZ 198	83		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-08
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 09:46
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	69		30-150
BZ 198	83		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-09
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 10:20
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	71		30-150
BZ 198	83		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-10
 Client ID: COMPOSITE 1 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 10:53
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	0.001	J	ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	66		30-150
BZ 198	62		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-11
 Client ID: COMPOSITE 1 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 11:27
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	0.002		ug/l	0.001	0.001	1
CI4-BZ#44	0.001	J	ug/l	0.001	0.001	1
CI4-BZ#49	0.001		ug/l	0.001	0.001	1
CI4-BZ#52	0.002		ug/l	0.001	0.001	1
CI4-BZ#66	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	0.001		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	0.001		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	0.001		ug/l	0.001	0.001	1
CI6-BZ#153	0.001		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	0.001	J	ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	70		30-150
BZ 198	66		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-12
 Client ID: COMPOSITE 1 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 12:00
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	0.002		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	0.001	J	ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	61		30-150
BZ 198	59		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-13
 Client ID: COMPOSITE 2 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 12:34
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	0.001	J	ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	67		30-150
BZ 198	75		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-14
 Client ID: COMPOSITE 2 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 14:14
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	0.001	J	ug/l	0.001	0.001	1
CI3-BZ#28	0.002		ug/l	0.001	0.001	1
CI4-BZ#44	0.001	J	ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	0.001	J	ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	0.001	J	ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	66		30-150
BZ 198	67		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-15
 Client ID: COMPOSITE 2 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 14:48
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	0.001	J	ug/l	0.001	0.001	1
CI3-BZ#28	0.001		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	0.001	J	ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	67		30-150
BZ 198	73		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-16
 Client ID: COMPOSITE 6 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 15:21
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	63		30-150
BZ 198	67		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-17
 Client ID: COMPOSITE 6 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 15:54
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	58		30-150
BZ 198	57		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-18
 Client ID: COMPOSITE 6 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/17/18 16:27
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.001	0.001	1
CI3-BZ#18	ND		ug/l	0.001	0.001	1
CI3-BZ#28	ND		ug/l	0.001	0.001	1
CI4-BZ#44	ND		ug/l	0.001	0.001	1
CI4-BZ#49	ND		ug/l	0.001	0.001	1
CI4-BZ#52	ND		ug/l	0.001	0.001	1
CI4-BZ#66	ND		ug/l	0.001	0.001	1
CI5-BZ#87	ND		ug/l	0.001	0.001	1
CI5-BZ#101	ND		ug/l	0.001	0.001	1
CI5-BZ#105	ND		ug/l	0.001	0.001	1
CI5-BZ#118	ND		ug/l	0.001	0.001	1
CI6-BZ#128	ND		ug/l	0.001	0.001	1
CI6-BZ#138	ND		ug/l	0.001	0.001	1
CI6-BZ#153	ND		ug/l	0.001	0.001	1
CI7-BZ#170	ND		ug/l	0.001	0.001	1
CI7-BZ#180	ND		ug/l	0.001	0.001	1
CI7-BZ#183	ND		ug/l	0.001	0.001	1
CI7-BZ#184	ND		ug/l	0.001	0.001	1
CI7-BZ#187	ND		ug/l	0.001	0.001	1
CI8-BZ#195	ND		ug/l	0.001	0.001	1
CI9-BZ#206	ND		ug/l	0.001	0.001	1
CI10-BZ#209	ND		ug/l	0.001	0.001	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	59		30-150
BZ 198	67		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 11/16/18 15:04
Analyst: GP

Extraction Method: EPA 3510C
Extraction Date: 11/01/18 06:00

Parameter	Result	Qualifier	Units	RL	MDL
PCB Congeners (RIM List) - Mansfield Lab for sample(s): 01-18 Batch: WG1174636-1					
C12-BZ#8	ND		ug/l	0.001	0.001
C13-BZ#18	ND		ug/l	0.001	0.001
C13-BZ#28	ND		ug/l	0.001	0.001
C14-BZ#44	ND		ug/l	0.001	0.001
C14-BZ#49	ND		ug/l	0.001	0.001
C14-BZ#52	ND		ug/l	0.001	0.001
C14-BZ#66	ND		ug/l	0.001	0.001
C15-BZ#87	ND		ug/l	0.001	0.001
C15-BZ#101	ND		ug/l	0.001	0.001
C15-BZ#105	ND		ug/l	0.001	0.001
C15-BZ#118	ND		ug/l	0.001	0.001
C16-BZ#128	ND		ug/l	0.001	0.001
C16-BZ#138	ND		ug/l	0.001	0.001
C16-BZ#153	ND		ug/l	0.001	0.001
C17-BZ#170	ND		ug/l	0.001	0.001
C17-BZ#180	ND		ug/l	0.001	0.001
C17-BZ#183	ND		ug/l	0.001	0.001
C17-BZ#184	ND		ug/l	0.001	0.001
C17-BZ#187	ND		ug/l	0.001	0.001
C18-BZ#195	ND		ug/l	0.001	0.001
C19-BZ#206	ND		ug/l	0.001	0.001
C110-BZ#209	ND		ug/l	0.001	0.001

Surrogate	%Recovery	Qualifier	Acceptance Criteria
DBOB	72		30-150
BZ 198	80		30-150



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 Batch: WG1174636-2 WG1174636-3								
Cl2-BZ#8	97		100		50-120	3		30
Cl3-BZ#18	94		95		50-120	1		30
Cl3-BZ#28	99		100		50-120	1		30
Cl4-BZ#44	106		109		50-120	3		30
Cl4-BZ#49	94		96		50-120	2		30
Cl4-BZ#52	102		107		50-120	5		30
Cl4-BZ#66	100		103		50-120	3		30
Cl5-BZ#87	99		103		50-120	4		30
Cl5-BZ#101	97		100		50-120	3		30
Cl5-BZ#105	99		102		50-120	3		30
Cl5-BZ#118	98		102		50-120	4		30
Cl6-BZ#128	93		94		50-120	1		30
Cl6-BZ#138	92		95		50-120	3		30
Cl6-BZ#153	94		98		50-120	4		30
Cl7-BZ#170	88		93		50-120	6		30
Cl7-BZ#180	84		86		50-120	2		30
Cl7-BZ#183	82		85		50-120	4		30
Cl7-BZ#184	88		92		50-120	4		30
Cl7-BZ#187	86		89		50-120	3		30
Cl8-BZ#195	91		94		50-120	3		30
Cl9-BZ#206	88		91		50-120	3		30
Cl10-BZ#209	85		89		50-120	5		30



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 Batch: WG1174636-2 WG1174636-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
DBOB	76		76		30-150
BZ 198	85		88		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1174636-4 WG1174636-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1												
CI2-BZ#8	ND	0.102	0.088	86		0.093	93		50-120	5		30
CI3-BZ#18	0.001J	0.102	0.087	85		0.091	91		50-120	5		30
CI3-BZ#28	ND	0.102	0.095	93		0.100	100		50-120	5		30
CI4-BZ#44	ND	0.102	0.099	97		0.105	105		50-120	6		30
CI4-BZ#49	ND	0.102	0.089	87		0.097	97		50-120	9		30
CI4-BZ#52	ND	0.102	0.095	93		0.096	96		50-120	1		30
CI4-BZ#66	ND	0.102	0.092	91		0.097	97		50-120	5		30
CI5-BZ#87	ND	0.102	0.086	85		0.093	93		50-120	8		30
CI5-BZ#101	ND	0.102	0.085	83		0.091	91		50-120	7		30
CI5-BZ#105	0.001J	0.102	0.088	86		0.094	94		50-120	7		30
CI5-BZ#118	ND	0.102	0.083	82		0.089	89		50-120	7		30
CI6-BZ#128	ND	0.102	0.076	74		0.081	81		50-120	7		30
CI6-BZ#138	ND	0.102	0.077	75		0.083	83		50-120	8		30
CI6-BZ#153	ND	0.102	0.077	75		0.083	83		50-120	8		30
CI7-BZ#170	ND	0.102	0.075	73		0.082	82		50-120	9		30
CI7-BZ#180	ND	0.102	0.067	66		0.072	72		50-120	7		30
CI7-BZ#183	ND	0.102	0.068	66		0.074	74		50-120	9		30
CI7-BZ#184	ND	0.102	0.070	69		0.076	76		50-120	8		30
CI7-BZ#187	ND	0.102	0.070	69		0.076	76		50-120	8		30
CI8-BZ#195	ND	0.102	0.077	76		0.084	84		50-120	8		30
CI9-BZ#206	ND	0.102	0.070	68		0.077	77		50-120	9		30
CI10-BZ#209	ND	0.102	0.067	65		0.073	73		50-120	9		30

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1174636-4 WG1174636-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1

Surrogate	MS		MSD		Acceptance Criteria
	% Recovery	Qualifier	% Recovery	Qualifier	
BZ 198	67		69		30-150
DBOB	68		67		30-150



PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-01
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 19:02
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0026	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	64		30-150	A
BZ 198	73		30-150	A
DBOB	57		30-150	B
BZ 198	81		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-02
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 19:35
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0025	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	B
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	67		30-150	A
BZ 198	71		30-150	A
DBOB	61		30-150	B
BZ 198	80		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-03
 Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 20:09
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0024	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	A
BZ 198	70		30-150	A
DBOB	59		30-150	B
BZ 198	78		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-04
Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP1
Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
Date Received: 10/25/18
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 11/14/18 20:43
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0030	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0260	0.0130	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	66		30-150	A
BZ 198	72		30-150	A
DBOB	59		30-150	B
BZ 198	80		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-05
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 21:17
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0023	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	64		30-150	A
BZ 198	67		30-150	A
DBOB	52		30-150	B
BZ 198	72		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-06
 Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 10:55
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 21:51
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0029	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	62		30-150	A
BZ 198	71		30-150	A
DBOB	57		30-150	B
BZ 198	80		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-07
Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP1
Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
Date Received: 10/25/18
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 11/14/18 22:25
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0026	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	62		30-150	A
BZ 198	70		30-150	A
DBOB	56		30-150	B
BZ 198	78		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-08
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 22:59
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0032	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	66		30-150	A
BZ 198	73		30-150	A
DBOB	58		30-150	B
BZ 198	82		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-09
 Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 11:30
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 23:33
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0029	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0274	0.0137	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	59		30-150	A
BZ 198	71		30-150	A
DBOB	53		30-150	B
BZ 198	79		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-10
 Client ID: COMPOSITE 1 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 00:07
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0032	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0020	P	ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0005	P	ug/l	0.0005	0.0005	1	B
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0018	P	ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	A
BZ 198	57		30-150	A
DBOB	50		30-150	B
BZ 198	61		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-11
 Client ID: COMPOSITE 1 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 00:41
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0026	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0009	P	ug/l	0.0005	0.0005	1	A
Dieldrin	0.0016		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0260	0.0130	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	62		30-150	A
BZ 198	59		30-150	A
DBOB	53		30-150	B
BZ 198	65		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-12
 Client ID: COMPOSITE 1 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 13:10
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 01:15
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0026	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0008	P	ug/l	0.0005	0.0005	1	A
Dieldrin	0.0013	P	ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	58		30-150	A
BZ 198	54		30-150	A
DBOB	49		30-150	B
BZ 198	60		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-13
 Client ID: COMPOSITE 2 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 01:49
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0023	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0020	P	ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0006	P	ug/l	0.0005	0.0005	1	A
Dieldrin	0.0009		ug/l	0.0005	0.0005	1	A
Endrin	0.0021	P	ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0016	P	ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	64		30-150	A
BZ 198	70		30-150	A
DBOB	48		30-150	B
BZ 198	76		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-14
 Client ID: COMPOSITE 2 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 03:31
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0021	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0018	P	ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0006		ug/l	0.0005	0.0005	1	A
Dieldrin	0.0014	P	ug/l	0.0005	0.0005	1	A
Endrin	0.0019	P	ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0014	P	ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	56		30-150	A
BZ 198	57		30-150	A
DBOB	48		30-150	B
BZ 198	60		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-15
 Client ID: COMPOSITE 2 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 14:05
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 04:05
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0024	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0019	P	ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0008	P	ug/l	0.0005	0.0005	1	A
Dieldrin	0.0010	P	ug/l	0.0005	0.0005	1	A
Endrin	0.0019	P	ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0015	P	ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0263	0.0131	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	57		30-150	A
BZ 198	65		30-150	A
DBOB	47		30-150	B
BZ 198	72		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-16
 Client ID: COMPOSITE 6 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 04:39
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0022	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0010	P	ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	0.0016	P	ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0255	0.0127	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	61		30-150	A
BZ 198	60		30-150	A
DBOB	49		30-150	B
BZ 198	65		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-17
 Client ID: COMPOSITE 6 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 05:13
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0029	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0010	P	ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	0.0014	P	ug/l	0.0005	0.0005	1	A
Endrin	0.0005		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	64		30-150	A
BZ 198	55		30-150	A
DBOB	48		30-150	B
BZ 198	59		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

SAMPLE RESULTS

Lab ID: L1843759-18
 Client ID: COMPOSITE 6 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/25/18 15:20
 Date Received: 10/25/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/15/18 05:47
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/01/18 06:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	0.0024	P	ug/l	0.0005	0.0005	1	B
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0009	P	ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	0.0013	P	ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	60		30-150	A
BZ 198	59		30-150	A
DBOB	46		30-150	B
BZ 198	62		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8081B
Analytical Date: 11/14/18 16:12
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 11/01/18 06:38

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-18 Batch: WG1174635-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Endosulfan I	ND		ug/l	0.0005	0.0005	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	74		30-150	A
BZ 198	78		30-150	A
DBOB	71		30-150	B
BZ 198	81		30-150	B

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1174635-2 WG1174635-3									
gamma-BHC	68		73		50-120	6		30	A
Heptachlor	73		75		50-120	3		30	A
Aldrin	77		81		50-120	5		30	A
Chloropyrifos	69		58		50-120	17		30	A
trans-Chlordane	90		89		50-120	1		30	A
Endosulfan I	90		89		50-120	1		30	A
cis-Chlordane	86		87		50-120	1		30	A
Dieldrin	105		103		50-120	2		30	A
Endrin	99		93		50-120	6		30	A
4,4'-DDT	98		92		50-120	6		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	66		69		30-150	A
BZ 198	80		75		30-150	A
DBOB	65		67		30-150	B
BZ 198	88		82		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1174635-2 WG1174635-3									
Heptachlor epoxide	81		81		50-120	1		30	B
Endosulfan II	95		85		50-120	12		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	66		69		30-150	A
BZ 198	80		75		30-150	A
DBOB	65		67		30-150	B
BZ 198	88		82		30-150	B



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1174635-4 WG1174635-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1													
gamma-BHC	ND	0.102	0.0804	78		0.0713	71		50-120	12		30	A
Heptachlor	ND	0.102	0.0775	76		0.0667	67		50-120	15		30	A
Aldrin	ND	0.102	0.0754	74		0.0706	71		50-120	7		30	A
Chloropyrifos	ND	0.102	0.0826	81		0.0739	74		50-120	11		30	A
Heptachlor epoxide	ND	0.102	0.0849	83		0.0787	79		50-120	8		30	B
trans-Chlordane	ND	0.102	0.0922	90		0.0848	84		50-120	8		30	A
Endosulfan I	ND	0.102	0.0946	93		0.0864	86		50-120	9		30	A
cis-Chlordane	0.0006	0.102	0.0857	83		0.0785	78		50-120	9		30	A
Dieldrin	0.0009	0.102	0.1104	107		0.1018	101		50-120	8		30	A
Endrin	0.0021	0.102	0.1041	100		0.0948	93		50-120	9		30	A
Endosulfan II	ND	0.102	0.0971	95		0.0878	88		50-120	10		30	B
4,4'-DDT	ND	0.102	0.0924	91		0.0866	87		50-120	6		30	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
BZ 198	68		61		30-150	A
DBOB	73		68		30-150	A
BZ 198	73		66		30-150	B
DBOB	57		48		30-150	B



METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-01

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00130		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:14	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Chromium, Total	0.00015		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Copper, Total	0.00027		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Lead, Total	0.00026		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:19	EPA 7474	1,7474	BV
Nickel, Total	0.00024	J	mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Selenium, Total	0.0001	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:38	NA	86,1632A(M)	BV
Silver, Total	0.00006	J	mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM
Zinc, Total	0.00444		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:21	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-02

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00116		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:16	NA	86,1632A(M)	BV
Cadmium, Total	0.00002	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Chromium, Total	0.00022		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Copper, Total	0.00072		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Lead, Total	0.00046		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:22	EPA 7474	1,7474	BV
Nickel, Total	0.00067		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Selenium, Total	0.00018	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:40	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM
Zinc, Total	0.00321		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:25	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-03

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00110		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:18	NA	86,1632A(M)	BV
Cadmium, Total	0.00004		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Chromium, Total	0.00023		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Copper, Total	0.00081		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Lead, Total	0.00039		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:24	EPA 7474	1,7474	BV
Nickel, Total	0.00038	J	mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Selenium, Total	0.00020	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:42	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM
Zinc, Total	0.00327		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:30	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-04

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00098	J	mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:20	NA	86,1632A(M)	BV
Cadmium, Total	0.00005		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Chromium, Total	0.00013		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Copper, Total	0.00111		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Lead, Total	0.00038		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:27	EPA 7474	1,7474	BV
Nickel, Total	0.00058		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Selenium, Total	0.00016	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:44	NA	86,1632A(M)	BV
Silver, Total	0.00003	J	mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM
Zinc, Total	0.00379		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:34	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-05

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00146		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:26	NA	86,1632A(M)	BV
Cadmium, Total	0.00002	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Chromium, Total	0.00013		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Copper, Total	0.00115		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Lead, Total	0.00051		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:34	EPA 7474	1,7474	BV
Nickel, Total	0.00060		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Selenium, Total	0.00018	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:46	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM
Zinc, Total	0.00376		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:38	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-06

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00101		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:28	NA	86,1632A(M)	BV
Cadmium, Total	0.00002	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Chromium, Total	0.00012		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Copper, Total	0.00132		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Lead, Total	0.00069		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:37	EPA 7474	1,7474	BV
Nickel, Total	0.00069		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Selenium, Total	0.00015	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:52	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM
Zinc, Total	0.00336		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:42	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-07

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00107		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:30	NA	86,1632A(M)	BV
Cadmium, Total	0.00005		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Chromium, Total	0.00028		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Copper, Total	0.00320		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Lead, Total	0.00125		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:39	EPA 7474	1,7474	BV
Nickel, Total	0.00137		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Selenium, Total	0.00013	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:54	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM
Zinc, Total	0.00682		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:46	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-08

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00113		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:32	NA	86,1632A(M)	BV
Cadmium, Total	0.00003	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Chromium, Total	0.00016		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Copper, Total	0.00174		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Lead, Total	0.00050		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:42	EPA 7474	1,7474	BV
Nickel, Total	0.00075		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Selenium, Total	0.00013	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:56	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM
Zinc, Total	0.00349		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 19:50	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-09

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00105		mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:34	NA	86,1632A(M)	BV
Cadmium, Total	0.00003	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Chromium, Total	0.00023		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Copper, Total	0.00275		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Lead, Total	0.00062		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:44	EPA 7474	1,7474	BV
Nickel, Total	0.00139		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Selenium, Total	0.00015	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:58	NA	86,1632A(M)	BV
Silver, Total	0.00005	J	mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM
Zinc, Total	0.00476		mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:11	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-10

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.04015		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:19	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Chromium, Total	0.00044		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Copper, Total	0.00079		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Lead, Total	0.00054		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:47	EPA 7474	1,7474	BV
Nickel, Total	0.00060		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Selenium, Total	0.00016	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 13:00	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM
Zinc, Total	0.00151	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:15	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-11

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.04074		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:23	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Chromium, Total	0.00033		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Copper, Total	0.00076		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Lead, Total	0.00048		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:49	EPA 7474	1,7474	BV
Nickel, Total	0.00055		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Selenium, Total	0.00014	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:03	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM
Zinc, Total	0.00159	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:19	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-12

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03731		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:25	NA	86,1632A(M)	BV
Cadmium, Total	0.00004		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Chromium, Total	0.00039		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Copper, Total	0.00076		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Lead, Total	0.00053		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:52	EPA 7474	1,7474	BV
Nickel, Total	0.00054		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:05	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM
Zinc, Total	0.00160	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:24	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-13

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.04142		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:05	NA	86,1632A(M)	BV
Cadmium, Total	0.00008		mg/l	0.00004	0.00001	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Chromium, Total	0.00121		mg/l	0.00020	0.00003	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Copper, Total	0.00118		mg/l	0.00040	0.00007	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Lead, Total	0.00145		mg/l	0.00040	0.00006	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:09	EPA 7474	1,7474	BV
Nickel, Total	0.00074		mg/l	0.00040	0.00011	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Selenium, Total	0.00024	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:24	NA	86,1632A(M)	BV
Silver, Total	0.00006	J	mg/l	0.00008	0.00003	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM
Zinc, Total	0.00309		mg/l	0.00200	0.00068	10	11/16/18 09:00	11/16/18 14:33	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-14

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03645		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:27	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Chromium, Total	0.00081		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Copper, Total	0.00145		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Lead, Total	0.00093		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:54	EPA 7474	1,7474	BV
Nickel, Total	0.00058		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:07	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM
Zinc, Total	0.00189	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:28	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-15

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03816		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:29	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Chromium, Total	0.00073		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Copper, Total	0.00130		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Lead, Total	0.00084		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:57	EPA 7474	1,7474	BV
Nickel, Total	0.00050		mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Selenium, Total	0.00012	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:09	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM
Zinc, Total	0.00160	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:32	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-16

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.01901		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:31	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Chromium, Total	0.00032		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Copper, Total	0.00077		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Lead, Total	0.00034		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:04	EPA 7474	1,7474	BV
Nickel, Total	0.00038	J	mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Selenium, Total	0.00014	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:11	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM
Zinc, Total	0.00118	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:36	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-17

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.02087		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:33	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Chromium, Total	0.00029		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Copper, Total	0.00102		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Lead, Total	0.00047		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:07	EPA 7474	1,7474	BV
Nickel, Total	0.00035	J	mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Selenium, Total	0.00012	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:13	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM
Zinc, Total	0.00135	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:40	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-18

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.02533		mg/l	0.00500	0.00047	5	11/19/18 09:15	11/19/18 16:35	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Chromium, Total	0.00031		mg/l	0.00010	0.00003	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Copper, Total	0.00119		mg/l	0.00020	0.00007	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Lead, Total	0.00052		mg/l	0.00020	0.00006	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:09	EPA 7474	1,7474	BV
Nickel, Total	0.00031	J	mg/l	0.00040	0.00011	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Selenium, Total	0.00017	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 14:15	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM
Zinc, Total	0.00126	J	mg/l	0.00200	0.00068	10	11/19/18 10:06	11/19/18 20:44	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1177004-1										
Cadmium, Total	0.00003	J	mg/l	0.00004	0.00001	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Chromium, Total	0.00011	J	mg/l	0.00020	0.00003	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Copper, Total	0.00039	J	mg/l	0.00040	0.00007	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Lead, Total	0.00031	J	mg/l	0.00040	0.00006	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Nickel, Total	0.00037	J	mg/l	0.00040	0.00011	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM
Zinc, Total	0.00140	J	mg/l	0.00200	0.00068	10	11/16/18 09:00	11/16/18 14:13	1,6020B	AM

Prep Information

Digestion Method: CHELATION

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180587-1										
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 08:04	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180829-1										
Arsenic, Total	0.00011	J	mg/l	0.00100	0.00009	1	11/19/18 09:15	11/19/18 15:04	86,1632A(M)	BV

Prep Information

Digestion Method:



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180891-1										
Selenium, Total	0.00015	J	mg/l	0.00056	0.00009	1	11/19/18 10:42	11/19/18 12:20	86,1632A(M)	BV

Prep Information

Digestion Method:



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1177004-2								
Cadmium, Total	75	Q	-		80-120	-		20
Chromium, Total	02	Q	-		80-120	-		20
Copper, Total	60	Q	-		80-120	-		20
Lead, Total	73	Q	-		80-120	-		20
Nickel, Total	53	Q	-		80-120	-		20
Silver, Total	05	Q	-		80-120	-		20
Zinc, Total	69	Q	-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180587-2 SRM Lot Number: HPHGAF								
Mercury, Total	96		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180829-2 SRM Lot Number: A2HGAF								
Arsenic, Total	95		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180891-2 SRM Lot Number: A2HGAF								
Selenium, Total	100		-		80-120	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180587-3 WG1180587-4 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1												
Mercury, Total	ND	0.0025	0.00219	88		0.00213	85		80-120	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180829-3 WG1180829-4 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1												
Arsenic, Total	0.04142	0.01	0.04878	74	Q	0.05025	88		75-125	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180891-3 WG1180891-4 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1												
Selenium, Total	0.00024J	0.00556	0.00582	105		0.00571	103		75-125	2		20

Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1177004-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1						
Cadmium, Total	0.00008	0.00002J	mg/l	NC		20
Chromium, Total	0.00121	0.00063	mg/l	62	Q	20
Copper, Total	0.00118	0.00101	mg/l	16		20
Lead, Total	0.00145	0.00112	mg/l	26	Q	20
Nickel, Total	0.00074	0.00032J	mg/l	NC		20
Silver, Total	0.00006J	ND	mg/l	NC		20
Zinc, Total	0.00309	0.00237	mg/l	26	Q	20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180587-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180829-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1						
Arsenic, Total	0.04142	0.04262	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180891-5 QC Sample: L1843759-13 Client ID: COMPOSITE 2 ELUTRIATE-REP1						
Selenium, Total	0.00024J	0.00025J	mg/l	NC		20



INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-01

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:15	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-02

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:15	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-03

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 1 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:16	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-04

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:16	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-05

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:17	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-06

Date Collected: 10/25/18 10:55

Client ID: COMPOSITE 2 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:17	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-07

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:17	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-08

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:18	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-09

Date Collected: 10/25/18 11:30

Client ID: COMPOSITE 6 ELUTRIATE BLANK-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:18	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-10

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:19	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-11

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:20	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-12

Date Collected: 10/25/18 13:10

Client ID: COMPOSITE 1 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:21	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-13

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:21	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-14

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:22	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-15

Date Collected: 10/25/18 14:05

Client ID: COMPOSITE 2 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:23	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-16

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP1

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:23	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-17

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP2

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:24	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**SAMPLE RESULTS**

Lab ID: L1843759-18

Date Collected: 10/25/18 15:20

Client ID: COMPOSITE 6 ELUTRIATE-REP3

Date Received: 10/25/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:25	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-18 Batch: WG1172489-1									
Chromium, Hexavalent	ND	mg/l	0.010	0.003	1	10/26/18 01:30	10/26/18 03:14	121,3500CR-B	MA



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843759

Project Number: 60588790 TASK 6.0

Report Date: 11/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-18 Batch: WG1172489-2								
Chromium, Hexavalent	96		-		85-115	-		20



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-18 QC Batch ID: WG1172489-4 QC Sample: L1843759-18 Client ID: COMPOSITE 6 ELUTRIATE-REP3												
Chromium, Hexavalent	ND	0.1	0.099	99		-	-		85-115	-		20



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 6.0

Lab Number: L1843759

Report Date: 11/20/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-18 QC Batch ID: WG1172489-3 QC Sample: L1843759-17 Client ID: COMPOSITE 6 ELUTRIATE-REP2						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
A1	Absent
B	Absent
B1	Absent
C	Absent
C1	Absent
D	Absent
D1	Absent
E	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-01A	Plastic 950ml HNO3 preserved	A	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-01B	Plastic 950ml HNO3 preserved	A	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-01C	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		HEXCR-3500(1)
L1843759-01D	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1843759-01E	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1843759-01F	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-01G	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-PCBCONG-8270(7)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Serial_No:11201816:05
Lab Number: L1843759
Report Date: 11/20/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-02A	Plastic 950ml HNO3 preserved	D	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-02B	Plastic 950ml HNO3 preserved	D	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-02C	Plastic 950ml unpreserved	D	7	7	3.2	Y	Absent		HEXCR-3500(1)
L1843759-02D	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1843759-02E	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1843759-02F	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-02G	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-03A	Plastic 950ml HNO3 preserved	A	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-03B	Plastic 950ml HNO3 preserved	A	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-03C	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		HEXCR-3500(1)
L1843759-03D	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1843759-03E	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1843759-03F	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-03G	Amber 1000ml unpreserved	A	7	7	2.3	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-04A	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Serial_No:11201816:05
Lab Number: L1843759
Report Date: 11/20/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-04B	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-04C	Plastic 950ml unpreserved	B	7	7	2.7	Y	Absent		HEXCR-3500(1)
L1843759-04D	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1843759-04E	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1843759-04F	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-04G	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-05A	Plastic 950ml HNO3 preserved	D	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-05B	Plastic 950ml HNO3 preserved	D	<2	<2	3.2	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-05C	Plastic 950ml unpreserved	D	7	7	3.2	Y	Absent		HEXCR-3500(1)
L1843759-05D	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1843759-05E	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1843759-05F	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-05G	Amber 1000ml unpreserved	D	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-06A	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-06B	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-06C	Plastic 950ml unpreserved	B	7	7	2.7	Y	Absent		HEXCR-3500(1)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-06D	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1843759-06E	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1843759-06F	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-06G	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-07A	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-07B	Plastic 950ml HNO3 preserved	B	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-07C	Plastic 950ml unpreserved	B	7	7	2.7	Y	Absent		HEXCR-3500(1)
L1843759-07D	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1843759-07F	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-07G	Amber 1000ml unpreserved	B	7	7	2.7	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-08A	Plastic 950ml HNO3 preserved	C	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-08C	Plastic 950ml unpreserved	C	7	7	2.4	Y	Absent		HEXCR-3500(1)
L1843759-08D	Amber 1000ml unpreserved	C	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1843759-08F	Amber 1000ml unpreserved	C	7	7	2.4	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-08G	Amber 1000ml unpreserved	C	7	7	2.4	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-09A	Plastic 950ml HNO3 preserved	C	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-09B	Plastic 950ml HNO3 preserved	C	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-09C	Plastic 250ml unpreserved split	C	7	7	2.4	Y	Absent		HEXCR-3500(1)
L1843759-09D	Amber 1000ml unpreserved	C	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1843759-09E	Amber 1000ml unpreserved	C	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1843759-09F	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-09G	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-09H	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-09I	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-09L	Plastic 950ml unpreserved	A1	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1843759-09Y	Plastic 950ml HNO3 preserved	A1	<2	<2	2.8	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-10A	Plastic 950ml unpreserved	C	7	7	2.4	Y	Absent		HEXCR-3500(1)
L1843759-10B	Plastic 950ml HNO3 preserved	A1	<2	<2	2.8	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-10C	Plastic 950ml HNO3 preserved	A1	<2	<2	2.8	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-10D	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-10E	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-10F	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)
L1843759-10G	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)
L1843759-11A	Plastic 950ml unpreserved	B1	7	7	3.1	Y	Absent		HEXCR-3500(1)

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Project Number: 60588790 TASK 6.0

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-11B	Plastic 950ml HNO3 preserved	B1	<2	<2	3.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-11C	Plastic 950ml HNO3 preserved	B1	<2	<2	3.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-11D	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-11E	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-11F	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-8270(7)
L1843759-11G	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-8270(7)
L1843759-12A	Plastic 950ml unpreserved	B1	7	7	3.1	Y	Absent		HEXCR-3500(1)
L1843759-12B	Plastic 950ml HNO3 preserved	B1	<2	<2	3.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-12C	Plastic 950ml HNO3 preserved	B1	<2	<2	3.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-12D	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-12E	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-12F	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-8270(7)
L1843759-12G	Amber 1000ml unpreserved	B1	7	7	3.1	Y	Absent		A2-RIM-8270(7)
L1843759-13A	Plastic 950ml unpreserved	C	7	7	2.4	Y	Absent		HEXCR-3500(1)
L1843759-13B	Plastic 950ml unpreserved	C1	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843759-13C	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Serial_No:11201816:05
Lab Number: L1843759
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-13D	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-13E	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-13F	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-13G	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13H	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13I	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13J	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13K	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13L	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13M	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13N	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13O	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13P	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13Q	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13R	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13S	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13T	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-8270(7)
L1843759-13U	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-13V	Amber 1000ml unpreserved	C1	7	7	3.6	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1843759-13X	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-13Y	Plastic 950ml HNO3 preserved	C1	<2	<2	3.6	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-14A	Plastic 950ml unpreserved	C1	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843759-14B	Plastic 950ml unpreserved	C1	7	7	3.6	Y	Absent		HEXCR-3500(1)
L1843759-14C	Plastic 950ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-14D	Plastic 950ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-14E	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-14F	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-14G	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-14H	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-15A	Plastic 950ml unpreserved	D1	7	7	2.9	Y	Absent		HEXCR-3500(1)
L1843759-15B	Plastic 250ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-15C	Plastic 250ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-15D	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-15E	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-15F	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-15G	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-16A	Plastic 950ml unpreserved	D1	7	7	2.9	Y	Absent		HEXCR-3500(1)
L1843759-16B	Plastic 250ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-16C	Plastic 250ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-16D	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-16E	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-16F	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-16G	Amber 1000ml unpreserved	D1	7	7	2.9	Y	Absent		A2-RIM-8270(7)
L1843759-17A	Plastic 950ml unpreserved	D1	7	7	2.9	Y	Absent		HEXCR-3500(1)
L1843759-17B	Plastic 950ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-17C	Plastic 950ml HNO3 preserved	D1	<2	<2	2.9	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-17D	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843759**Project Number:** 60588790 TASK 6.0**Report Date:** 11/20/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843759-17E	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-17F	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)
L1843759-17G	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)
L1843759-18A	Plastic 950ml unpreserved	E	7	7	2.1	Y	Absent		HEXCR-3500(1)
L1843759-18B	Plastic 950ml HNO3 preserved	A1	<2	<2	2.8	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-18C	Plastic 950ml HNO3 preserved	A1	<2	<2	2.8	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1843759-18D	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1843759-18E	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-PEST-ELUT(7)
L1843759-18F	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)
L1843759-18G	Amber 1000ml unpreserved	A1	7	7	2.8	Y	Absent		A2-RIM-8270(7)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
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Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1843759
Report Date: 11/20/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 86 Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry. USEPA Office of Water, EPA Method 1632, Revision A, August 1998.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	Yes
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No – see narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No – see narrative
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	





Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	No	Pentachlorophenol 27.3%	Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	CCV associated with all field samples: C14-BZ#77 @ 17%, C15-BZ#126 @ 16%,	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	N/A		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	No	WG1180829-3 MS As(74%) WG1144004-3 MS Cd(50%), Cr(23%), Cu(42%), Pb(48%), Ni(27%), Ag(22%) and Zn(41%)	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	WG1177004-5 RPD Cr(62%), Pb(26%), Zn(26%)	In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





11843759

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor	
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803	Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen	
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com	ERR

Protocol: CENAE												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 1 Elutriate Blank - Rep 1	10/25/18	1055	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 1 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 1 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 1 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 1 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 1 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 1 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 1 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 1 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 1 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 1 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 1 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

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CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
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Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (ml.)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 2 Elutriate Blank - Rep 1	10/25/18	1055	ESZ	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 2 Elutriate Blank - Rep 2	↓	↓	↓	↓	2	1000	G	HNO3	Water	N	Total Metals
	Composite 2 Elutriate Blank - Rep 3	↓	↓	↓	↓	2	1000	G	HNO3	Water	N	Total Metals
	Composite 2 Elutriate Blank - Rep 1	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PCP
	Composite 2 Elutriate Blank - Rep 2	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PCP
	Composite 2 Elutriate Blank - Rep 3	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PCP
	Composite 2 Elutriate Blank - Rep 1	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PEST/CGR
	Composite 2 Elutriate Blank - Rep 2	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PEST/CGR
	Composite 2 Elutriate Blank - Rep 3	↓	↓	↓	↓	2	1000	G	4 C	Water	N	PEST/CGR
	Composite 2 Elutriate Blank - Rep 1	↓	↓	↓	↓	1	1000	P	4 C	Water	N	CR6
	Composite 2 Elutriate Blank - Rep 2	↓	↓	↓	↓	1	1000	P	4 C	Water	N	CR6
	Composite 2 Elutriate Blank - Rep 3	↓	↓	↓	↓	1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>Boyer D. Allen</i>	Date: 10/25/18	Time: 1733	Received By: <i>Subir A. Patel</i>	Date: 10/25	Time: 1733
Relinquished By: <i>Michael A. Patel</i>	Date: 10/25	Time: 1910	Received at Lab By: <i>Michael A. Patel</i>	Date: 10/25/18	Time: 1910

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Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com ERR

Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with containers)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions
	Composite 6 Elutriate Blank - Rep 1	10/25/18	1130	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 6 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 6 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 6 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 6 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 6 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 6 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 6 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 6 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 6 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 6 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 6 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/25/18	Time: 1733	Received By: <i>[Signature]</i> AAL	Date: 10/25	Time: 1733
Relinquished By: <i>[Signature]</i> DAC	Date: 10/25	Time: 1910	Received at Lab By: <i>[Signature]</i>	Date: 10/25/18	Time: 1910

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Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
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Protocol: GENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
Composite 1	Elutriate - Rep 1	10/25/18	1735	ES1	C	6	1000	G	HNO3	Water	N	Total Metals
Composite 1	Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
Composite 1	Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
Composite 1	Elutriate - Rep 1					6	1000	G	4 C	Water	N	PCP
Composite 1	Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
Composite 1	Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
Composite 1	Elutriate - Rep 1					6	1000	G	4 C	Water	N	PEST/CGR
Composite 1	Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
Composite 1	Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
Composite 1	Elutriate - Rep 1					3	1000	P	4 C	Water	N	CR6
Composite 1	Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
Composite 1	Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/25/18	Time: 1733	Received By: <i>[Signature]</i>	Date: 10/25	Time: 1733
Relinquished By: <i>[Signature]</i>	Date: 10/25	Time: 1910	Received at Lab By: <i>[Signature]</i>	Date: 10/25/18	Time: 1910

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Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
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Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
Composite 2 Elutriate - Rep 1	1 @ 10/25/18	10/25/18	1310	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
Composite 2 Elutriate - Rep 2						2	1000	G	HNO3	Water	N	Total Metals
Composite 2 Elutriate - Rep 3						2	1000	G	HNO3	Water	N	Total Metals
Composite 2 Elutriate - Rep 1						2	1000	G	4 C	Water	N	PCP
Composite 2 Elutriate - Rep 2						2	1000	G	4 C	Water	N	PCP
Composite 2 Elutriate - Rep 3						2	1000	G	4 C	Water	N	PCP
Composite 2 Elutriate - Rep 1						2	1000	G	4 C	Water	N	PEST/CGR
Composite 2 Elutriate - Rep 2						2	1000	G	4 C	Water	N	PEST/CGR
Composite 2 Elutriate - Rep 3						2	1000	G	4 C	Water	N	PEST/CGR
Composite 2 Elutriate - Rep 1						1	1000	P	4 C	Water	N	CR6
Composite 2 Elutriate - Rep 2						1	1000	P	4 C	Water	N	CR6
Composite 2 Elutriate - Rep 3						1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/25/18	Time: 1733	Received By: <i>[Signature]</i>	Date: 10/25	Time: 1732
Relinquished By: <i>[Signature]</i>	Date: 10/25	Time: 1910	Received at Lab By: <i>[Signature]</i>	Date: 10/25/18	Time: 1910

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Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com ERR

Protocol: GENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/S/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions.
Composite 6 Elutriate - Rep 1		10/25/18	1520	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
Composite 6 Elutriate - Rep 2						2	1000	G	HNO3	Water	N	Total Metals
Composite 6 Elutriate - Rep 3						2	1000	G	HNO3	Water	N	Total Metals
Composite 6 Elutriate - Rep 1						2	1000	G	4 C	Water	N	PCP
Composite 6 Elutriate - Rep 2						2	1000	G	4 C	Water	N	PCP
Composite 6 Elutriate - Rep 3						2	1000	G	4 C	Water	N	PCP
Composite 6 Elutriate - Rep 1						2	1000	G	4 C	Water	N	PEST/CGR
Composite 6 Elutriate - Rep 2						2	1000	G	4 C	Water	N	PEST/CGR
Composite 6 Elutriate - Rep 3						2	1000	G	4 C	Water	N	PEST/CGR
Composite 6 Elutriate - Rep 1						1	1000	P	4 C	Water	N	CR6
Composite 6 Elutriate - Rep 2						1	1000	P	4 C	Water	N	CR6
Composite 6 Elutriate - Rep 3						1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/25/18	Time: 1733	Received By: <i>[Signature]</i>	Date: 10/25/18	Time: 1733
Relinquished By: <i>[Signature]</i> AAC	Date: 10/25	Time: 1910	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 1910

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Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com

Protocol: CENAE ERR

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
43759-13	Composite 1 Elutriate - Rep 1	10/25/18	12:50	ESI	C	6	1000	G	HNO3	Water	N	Total Metals
-14	Composite 1 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
-15	Composite 2 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
-13	Composite 1 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PCP
-14	Composite 2 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
-15	Composite 2 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
-13	Composite 2 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PEST/CGR
-14	Composite 2 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
-15	Composite 2 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 1 Elutriate - Rep 1					3	1000	P	4 C	Water	N	CR6
	Composite 1 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 2 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 1725	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 1725
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 1950

Comments: ERR

COC Number: A1016866

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:11201816:05

L1843759

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com ERR

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
43259-16	Composite 6 Elutriate - Rep 1	10/25/18	1520	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
-17	Composite 6 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
-18	Composite 6 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
-16	Composite 6 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
-17	Composite 6 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
-18	Composite 6 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
-16	Composite 6 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/GGR
-17	Composite 6 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
-18	Composite 6 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 6 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 6 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 6 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments: _____

ERR

COC Number: A1018866

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
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ESI Job No:

Serial_No:11201816:05

L1843759

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com

ERR

Protocol: GENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Size (mL)	Type (P/G/T)	Field Preservation	Matrix B=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
43759-10	Composite 1 Elutriate - Rep 1	10/25/18	1310	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
-11	Composite 1 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
-12	Composite 1 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
-10	Composite 1 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
-11	Composite 1 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
-12	Composite 1 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
-10	Composite 1 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
-11	Composite 1 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
-12	Composite 1 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 1 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 1 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 1 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments:

ERR

COC Number: A1016885

Sample Delivery Group No:	Oct 2018	Page	of
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ANALYTICAL REPORT

Lab Number:	L1844003
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 6.0
Report Date:	11/28/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1844003-01	COMPOSITE 3 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-02	COMPOSITE 3 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-03	COMPOSITE 3 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-04	COMPOSITE 5 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/26/18 11:40	10/26/18
L1844003-05	COMPOSITE 5 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/26/18 11:40	10/26/18
L1844003-06	COMPOSITE 5 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/26/18 11:40	10/26/18
L1844003-07	COMPOSITE 4 ELUTRIATE BLANK-REP1	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-08	COMPOSITE 4 ELUTRIATE BLANK-REP2	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-09	COMPOSITE 4 ELUTRIATE BLANK-REP3	WATER	NEW HAVEN, CT	10/26/18 09:20	10/26/18
L1844003-10	COMPOSITE 5 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/26/18 15:25	10/26/18
L1844003-11	COMPOSITE 5 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/26/18 15:25	10/26/18
L1844003-12	COMPOSITE 5 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/26/18 15:25	10/26/18
L1844003-13	COMPOSITE 4 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/26/18 13:10	10/26/18
L1844003-14	COMPOSITE 4 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/26/18 13:10	10/26/18
L1844003-15	COMPOSITE 4 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/26/18 13:10	10/26/18
L1844003-16	COMPOSITE 3 ELUTRIATE- REP1	WATER	NEW HAVEN, CT	10/26/18 16:15	10/26/18
L1844003-17	COMPOSITE 3 ELUTRIATE- REP2	WATER	NEW HAVEN, CT	10/26/18 16:15	10/26/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1844003-18	COMPOSITE 3 ELUTRIATE- REP3	WATER	NEW HAVEN, CT	10/26/18 16:15	10/26/18



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Semivolatile Organics

The WG1175119-2/-3 LCS/LCSD RPD, associated with L1844003-01 through -18, is above the acceptance criteria for pentachlorophenol (40%).

PCBs and Pesticides: L1844003 had the original extraction batch compromised in the laboratory and was re-extracted with the method required holding time exceeded. Only the re-extract could be reported.

Pesticides

L1844003-11: The surrogate recovery is outside the individual acceptance criteria for bz198 (184%), but within the overall method allowances.

L1844003-13: The surrogate recovery is outside the individual acceptance criteria for bz198 (291%), but within the overall method allowances.

L1844003-14: The surrogate recovery is outside the individual acceptance criteria for bz198 (360%), but within the overall method allowances.

L1844003-16: The surrogate recovery is outside the individual acceptance criteria for bz198 (271%), but within the overall method allowances.

L1844003-17: The surrogate recovery is outside the individual acceptance criteria for bz98 (303%), but within the overall method allowances.

The WG1182113-2/-3 recoveries for heptachlor (39%/37%) and aldrin (37%/34%) are below the acceptance criteria; however, the associated MS/MSD recoveries within overall method allowances. No further action was taken.

Total Metals

The WG1177006-2 LCS recoveries, associated with L1844003-01 through -18, were below the acceptance

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Case Narrative (continued)

criteria for chromium (1%), copper (79%) and silver (0%); a second prep and run were also evaluated giving similar results; however, all results are considered to have a potentially low bias for these analytes.

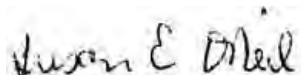
The WG1177006-3 MS recoveries, performed on L1844003-16, are below the acceptance criteria for cadmium (24%), chromium (12%), copper (0%), lead (7%), nickel (0%), silver (0%) and zinc (22%). The results of the native sample are considered to have a potentially low bias for these analytes.

Total Mercury

The WG1180588-3/-4 MS/MSD recovery, performed on L1844003-16, is outside the acceptance criteria for mercury (78%/78%); however, the associated LCS recovery is within overall method allowances. No further action was required.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 11/28/18

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-01
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 10:23
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.04	0.445	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			61		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-02
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 10:54
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.25	0.490	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			62		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-03
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 11:24
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.22	0.484	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	60		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-04
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 11:55
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab

Pentachlorophenol	ND		ug/l	2.00	0.436	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	62		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-05
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 12:25
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.08	0.454	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	58		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-06
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 12:56
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.17	0.474	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	42		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-07
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 13:26
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.06	0.450	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			37		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-08
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 13:57
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.25	0.490	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			54		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-09
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 14:27
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.13	0.464	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
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2,4,6-Tribromophenol	52		30-150
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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-10
 Client ID: COMPOSITE 5 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 14:58
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.98	0.432	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			74		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-11
 Client ID: COMPOSITE 5 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 15:28
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.96	0.428	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			76		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-12
 Client ID: COMPOSITE 5 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 15:58
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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RIM Semivolatile Organics by GC/MS - Mansfield Lab						
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Pentachlorophenol	ND		ug/l	2.04	0.445	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	64		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-13
 Client ID: COMPOSITE 4 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 16:29
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.98	0.432	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			64		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-14
 Client ID: COMPOSITE 4 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 16:59
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.00	0.436	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			76		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-15
 Client ID: COMPOSITE 4 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 17:29
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.00	0.436	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			78		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-16
 Client ID: COMPOSITE 3 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 17:59
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	2.00	0.436	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			75		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-17
 Client ID: COMPOSITE 3 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 19:30
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.94	0.423	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			73		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-18
 Client ID: COMPOSITE 3 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 11/10/18 20:00
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM Semivolatile Organics by GC/MS - Mansfield Lab						
Pentachlorophenol	ND		ug/l	1.96	0.428	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
2,4,6-Tribromophenol			57		30-150	

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
 Analytical Date: 11/09/18 16:02
 Analyst: PS

Extraction Method: EPA 3510C
 Extraction Date: 11/02/18 05:00

Parameter	Result	Qualifier	Units	RL	MDL
RIM Semivolatile Organics by GC/MS - Mansfield Lab for sample(s): 01-18 Batch: WG1175119-1					
Pentachlorophenol	ND		ug/l	2.00	0.436

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	82		30-150

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-18 Batch: WG1175119-2 WG1175119-3								
Pentachlorophenol	75		50		50-120	40	Q	30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,6-Tribromophenol	94		92		30-150



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM Semivolatile Organics by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1175119-4 WG1175119-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
Pentachlorophenol	ND	10	8.30	83		9.05	90		50-120	9		30

Surrogate	MS % Recovery		Qualifier	MSD % Recovery		Qualifier	Acceptance Criteria
2,4,6-Tribromophenol	102			102			30-150



PCBS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-01
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 15:07
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00111	0.00056	1
CI3-BZ#18	ND		ug/l	0.00111	0.00056	1
CI3-BZ#28	ND		ug/l	0.00111	0.00056	1
CI4-BZ#44	ND		ug/l	0.00111	0.00056	1
CI4-BZ#49	ND		ug/l	0.00111	0.00056	1
CI4-BZ#52	ND		ug/l	0.00111	0.00056	1
CI4-BZ#66	ND		ug/l	0.00111	0.00056	1
CI5-BZ#87	ND		ug/l	0.00111	0.00056	1
CI5-BZ#101	ND		ug/l	0.00111	0.00056	1
CI5-BZ#105	ND		ug/l	0.00111	0.00056	1
CI5-BZ#118	ND		ug/l	0.00111	0.00056	1
CI6-BZ#128	ND		ug/l	0.00111	0.00056	1
CI6-BZ#138	ND		ug/l	0.00111	0.00056	1
CI6-BZ#153	ND		ug/l	0.00111	0.00056	1
CI7-BZ#170	ND		ug/l	0.00111	0.00056	1
CI7-BZ#180	ND		ug/l	0.00111	0.00056	1
CI7-BZ#183	ND		ug/l	0.00111	0.00056	1
CI7-BZ#184	ND		ug/l	0.00111	0.00056	1
CI7-BZ#187	ND		ug/l	0.00111	0.00056	1
CI8-BZ#195	ND		ug/l	0.00111	0.00056	1
CI9-BZ#206	ND		ug/l	0.00111	0.00056	1
CI10-BZ#209	ND		ug/l	0.00111	0.00056	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	65		30-150
BZ 198	87		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-02
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 15:40
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00102	0.00051	1
CI3-BZ#18	ND		ug/l	0.00102	0.00051	1
CI3-BZ#28	ND		ug/l	0.00102	0.00051	1
CI4-BZ#44	ND		ug/l	0.00102	0.00051	1
CI4-BZ#49	ND		ug/l	0.00102	0.00051	1
CI4-BZ#52	ND		ug/l	0.00102	0.00051	1
CI4-BZ#66	ND		ug/l	0.00102	0.00051	1
CI5-BZ#87	ND		ug/l	0.00102	0.00051	1
CI5-BZ#101	ND		ug/l	0.00102	0.00051	1
CI5-BZ#105	ND		ug/l	0.00102	0.00051	1
CI5-BZ#118	ND		ug/l	0.00102	0.00051	1
CI6-BZ#128	ND		ug/l	0.00102	0.00051	1
CI6-BZ#138	ND		ug/l	0.00102	0.00051	1
CI6-BZ#153	ND		ug/l	0.00102	0.00051	1
CI7-BZ#170	ND		ug/l	0.00102	0.00051	1
CI7-BZ#180	ND		ug/l	0.00102	0.00051	1
CI7-BZ#183	ND		ug/l	0.00102	0.00051	1
CI7-BZ#184	ND		ug/l	0.00102	0.00051	1
CI7-BZ#187	ND		ug/l	0.00102	0.00051	1
CI8-BZ#195	ND		ug/l	0.00102	0.00051	1
CI9-BZ#206	ND		ug/l	0.00102	0.00051	1
CI10-BZ#209	ND		ug/l	0.00102	0.00051	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	70		30-150
BZ 198	84		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-03
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 16:14
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00110	0.00055	1
CI3-BZ#18	ND		ug/l	0.00110	0.00055	1
CI3-BZ#28	ND		ug/l	0.00110	0.00055	1
CI4-BZ#44	ND		ug/l	0.00110	0.00055	1
CI4-BZ#49	ND		ug/l	0.00110	0.00055	1
CI4-BZ#52	ND		ug/l	0.00110	0.00055	1
CI4-BZ#66	ND		ug/l	0.00110	0.00055	1
CI5-BZ#87	ND		ug/l	0.00110	0.00055	1
CI5-BZ#101	ND		ug/l	0.00110	0.00055	1
CI5-BZ#105	ND		ug/l	0.00110	0.00055	1
CI5-BZ#118	ND		ug/l	0.00110	0.00055	1
CI6-BZ#128	ND		ug/l	0.00110	0.00055	1
CI6-BZ#138	ND		ug/l	0.00110	0.00055	1
CI6-BZ#153	ND		ug/l	0.00110	0.00055	1
CI7-BZ#170	ND		ug/l	0.00110	0.00055	1
CI7-BZ#180	ND		ug/l	0.00110	0.00055	1
CI7-BZ#183	ND		ug/l	0.00110	0.00055	1
CI7-BZ#184	ND		ug/l	0.00110	0.00055	1
CI7-BZ#187	ND		ug/l	0.00110	0.00055	1
CI8-BZ#195	ND		ug/l	0.00110	0.00055	1
CI9-BZ#206	ND		ug/l	0.00110	0.00055	1
CI10-BZ#209	ND		ug/l	0.00110	0.00055	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	46		30-150
BZ 198	59		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-04
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 16:48
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00105	0.00053	1
CI3-BZ#18	ND		ug/l	0.00105	0.00053	1
CI3-BZ#28	ND		ug/l	0.00105	0.00053	1
CI4-BZ#44	ND		ug/l	0.00105	0.00053	1
CI4-BZ#49	ND		ug/l	0.00105	0.00053	1
CI4-BZ#52	ND		ug/l	0.00105	0.00053	1
CI4-BZ#66	ND		ug/l	0.00105	0.00053	1
CI5-BZ#87	ND		ug/l	0.00105	0.00053	1
CI5-BZ#101	ND		ug/l	0.00105	0.00053	1
CI5-BZ#105	ND		ug/l	0.00105	0.00053	1
CI5-BZ#118	ND		ug/l	0.00105	0.00053	1
CI6-BZ#128	ND		ug/l	0.00105	0.00053	1
CI6-BZ#138	ND		ug/l	0.00105	0.00053	1
CI6-BZ#153	ND		ug/l	0.00105	0.00053	1
CI7-BZ#170	ND		ug/l	0.00105	0.00053	1
CI7-BZ#180	ND		ug/l	0.00105	0.00053	1
CI7-BZ#183	ND		ug/l	0.00105	0.00053	1
CI7-BZ#184	ND		ug/l	0.00105	0.00053	1
CI7-BZ#187	ND		ug/l	0.00105	0.00053	1
CI8-BZ#195	ND		ug/l	0.00105	0.00053	1
CI9-BZ#206	ND		ug/l	0.00105	0.00053	1
CI10-BZ#209	ND		ug/l	0.00105	0.00053	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	65		30-150
BZ 198	84		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-05
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 17:21
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00110	0.00055	1
CI3-BZ#18	ND		ug/l	0.00110	0.00055	1
CI3-BZ#28	ND		ug/l	0.00110	0.00055	1
CI4-BZ#44	ND		ug/l	0.00110	0.00055	1
CI4-BZ#49	ND		ug/l	0.00110	0.00055	1
CI4-BZ#52	ND		ug/l	0.00110	0.00055	1
CI4-BZ#66	ND		ug/l	0.00110	0.00055	1
CI5-BZ#87	ND		ug/l	0.00110	0.00055	1
CI5-BZ#101	ND		ug/l	0.00110	0.00055	1
CI5-BZ#105	ND		ug/l	0.00110	0.00055	1
CI5-BZ#118	ND		ug/l	0.00110	0.00055	1
CI6-BZ#128	ND		ug/l	0.00110	0.00055	1
CI6-BZ#138	ND		ug/l	0.00110	0.00055	1
CI6-BZ#153	ND		ug/l	0.00110	0.00055	1
CI7-BZ#170	ND		ug/l	0.00110	0.00055	1
CI7-BZ#180	ND		ug/l	0.00110	0.00055	1
CI7-BZ#183	ND		ug/l	0.00110	0.00055	1
CI7-BZ#184	ND		ug/l	0.00110	0.00055	1
CI7-BZ#187	ND		ug/l	0.00110	0.00055	1
CI8-BZ#195	ND		ug/l	0.00110	0.00055	1
CI9-BZ#206	ND		ug/l	0.00110	0.00055	1
CI10-BZ#209	ND		ug/l	0.00110	0.00055	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	70		30-150
BZ 198	89		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-06
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 17:55
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00108	0.00054	1
CI3-BZ#18	ND		ug/l	0.00108	0.00054	1
CI3-BZ#28	ND		ug/l	0.00108	0.00054	1
CI4-BZ#44	ND		ug/l	0.00108	0.00054	1
CI4-BZ#49	ND		ug/l	0.00108	0.00054	1
CI4-BZ#52	ND		ug/l	0.00108	0.00054	1
CI4-BZ#66	ND		ug/l	0.00108	0.00054	1
CI5-BZ#87	ND		ug/l	0.00108	0.00054	1
CI5-BZ#101	ND		ug/l	0.00108	0.00054	1
CI5-BZ#105	ND		ug/l	0.00108	0.00054	1
CI5-BZ#118	ND		ug/l	0.00108	0.00054	1
CI6-BZ#128	ND		ug/l	0.00108	0.00054	1
CI6-BZ#138	ND		ug/l	0.00108	0.00054	1
CI6-BZ#153	ND		ug/l	0.00108	0.00054	1
CI7-BZ#170	ND		ug/l	0.00108	0.00054	1
CI7-BZ#180	ND		ug/l	0.00108	0.00054	1
CI7-BZ#183	ND		ug/l	0.00108	0.00054	1
CI7-BZ#184	ND		ug/l	0.00108	0.00054	1
CI7-BZ#187	ND		ug/l	0.00108	0.00054	1
CI8-BZ#195	ND		ug/l	0.00108	0.00054	1
CI9-BZ#206	ND		ug/l	0.00108	0.00054	1
CI10-BZ#209	ND		ug/l	0.00108	0.00054	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	67		30-150
BZ 198	87		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-07
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 18:29
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00102	0.00051	1
CI3-BZ#18	ND		ug/l	0.00102	0.00051	1
CI3-BZ#28	ND		ug/l	0.00102	0.00051	1
CI4-BZ#44	ND		ug/l	0.00102	0.00051	1
CI4-BZ#49	ND		ug/l	0.00102	0.00051	1
CI4-BZ#52	ND		ug/l	0.00102	0.00051	1
CI4-BZ#66	ND		ug/l	0.00102	0.00051	1
CI5-BZ#87	ND		ug/l	0.00102	0.00051	1
CI5-BZ#101	ND		ug/l	0.00102	0.00051	1
CI5-BZ#105	ND		ug/l	0.00102	0.00051	1
CI5-BZ#118	ND		ug/l	0.00102	0.00051	1
CI6-BZ#128	ND		ug/l	0.00102	0.00051	1
CI6-BZ#138	ND		ug/l	0.00102	0.00051	1
CI6-BZ#153	ND		ug/l	0.00102	0.00051	1
CI7-BZ#170	ND		ug/l	0.00102	0.00051	1
CI7-BZ#180	ND		ug/l	0.00102	0.00051	1
CI7-BZ#183	ND		ug/l	0.00102	0.00051	1
CI7-BZ#184	ND		ug/l	0.00102	0.00051	1
CI7-BZ#187	ND		ug/l	0.00102	0.00051	1
CI8-BZ#195	ND		ug/l	0.00102	0.00051	1
CI9-BZ#206	ND		ug/l	0.00102	0.00051	1
CI10-BZ#209	ND		ug/l	0.00102	0.00051	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	64		30-150
BZ 198	87		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-08
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 19:03
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00110	0.00055	1
CI3-BZ#18	ND		ug/l	0.00110	0.00055	1
CI3-BZ#28	ND		ug/l	0.00110	0.00055	1
CI4-BZ#44	ND		ug/l	0.00110	0.00055	1
CI4-BZ#49	ND		ug/l	0.00110	0.00055	1
CI4-BZ#52	ND		ug/l	0.00110	0.00055	1
CI4-BZ#66	ND		ug/l	0.00110	0.00055	1
CI5-BZ#87	ND		ug/l	0.00110	0.00055	1
CI5-BZ#101	ND		ug/l	0.00110	0.00055	1
CI5-BZ#105	ND		ug/l	0.00110	0.00055	1
CI5-BZ#118	ND		ug/l	0.00110	0.00055	1
CI6-BZ#128	ND		ug/l	0.00110	0.00055	1
CI6-BZ#138	ND		ug/l	0.00110	0.00055	1
CI6-BZ#153	ND		ug/l	0.00110	0.00055	1
CI7-BZ#170	ND		ug/l	0.00110	0.00055	1
CI7-BZ#180	ND		ug/l	0.00110	0.00055	1
CI7-BZ#183	ND		ug/l	0.00110	0.00055	1
CI7-BZ#184	ND		ug/l	0.00110	0.00055	1
CI7-BZ#187	ND		ug/l	0.00110	0.00055	1
CI8-BZ#195	ND		ug/l	0.00110	0.00055	1
CI9-BZ#206	ND		ug/l	0.00110	0.00055	1
CI10-BZ#209	ND		ug/l	0.00110	0.00055	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	63		30-150
BZ 198	84		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-09
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 19:37
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00103	0.00052	1
CI3-BZ#18	ND		ug/l	0.00103	0.00052	1
CI3-BZ#28	ND		ug/l	0.00103	0.00052	1
CI4-BZ#44	ND		ug/l	0.00103	0.00052	1
CI4-BZ#49	ND		ug/l	0.00103	0.00052	1
CI4-BZ#52	ND		ug/l	0.00103	0.00052	1
CI4-BZ#66	ND		ug/l	0.00103	0.00052	1
CI5-BZ#87	ND		ug/l	0.00103	0.00052	1
CI5-BZ#101	ND		ug/l	0.00103	0.00052	1
CI5-BZ#105	ND		ug/l	0.00103	0.00052	1
CI5-BZ#118	ND		ug/l	0.00103	0.00052	1
CI6-BZ#128	ND		ug/l	0.00103	0.00052	1
CI6-BZ#138	ND		ug/l	0.00103	0.00052	1
CI6-BZ#153	ND		ug/l	0.00103	0.00052	1
CI7-BZ#170	ND		ug/l	0.00103	0.00052	1
CI7-BZ#180	ND		ug/l	0.00103	0.00052	1
CI7-BZ#183	ND		ug/l	0.00103	0.00052	1
CI7-BZ#184	ND		ug/l	0.00103	0.00052	1
CI7-BZ#187	ND		ug/l	0.00103	0.00052	1
CI8-BZ#195	ND		ug/l	0.00103	0.00052	1
CI9-BZ#206	ND		ug/l	0.00103	0.00052	1
CI10-BZ#209	ND		ug/l	0.00103	0.00052	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	69		30-150
BZ 198	90		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-10
 Client ID: COMPOSITE 5 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 20:10
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00099	0.00050	1
CI3-BZ#18	ND		ug/l	0.00099	0.00050	1
CI3-BZ#28	ND		ug/l	0.00099	0.00050	1
CI4-BZ#44	ND		ug/l	0.00099	0.00050	1
CI4-BZ#49	ND		ug/l	0.00099	0.00050	1
CI4-BZ#52	0.00088	J	ug/l	0.00099	0.00050	1
CI4-BZ#66	ND		ug/l	0.00099	0.00050	1
CI5-BZ#87	ND		ug/l	0.00099	0.00050	1
CI5-BZ#101	0.00060	J	ug/l	0.00099	0.00050	1
CI5-BZ#105	ND		ug/l	0.00099	0.00050	1
CI5-BZ#118	0.00079	J	ug/l	0.00099	0.00050	1
CI6-BZ#128	ND		ug/l	0.00099	0.00050	1
CI6-BZ#138	0.00085	J	ug/l	0.00099	0.00050	1
CI6-BZ#153	0.00087	J	ug/l	0.00099	0.00050	1
CI7-BZ#170	ND		ug/l	0.00099	0.00050	1
CI7-BZ#180	0.00063	J	ug/l	0.00099	0.00050	1
CI7-BZ#183	ND		ug/l	0.00099	0.00050	1
CI7-BZ#184	ND		ug/l	0.00099	0.00050	1
CI7-BZ#187	ND		ug/l	0.00099	0.00050	1
CI8-BZ#195	ND		ug/l	0.00099	0.00050	1
CI9-BZ#206	ND		ug/l	0.00099	0.00050	1
CI10-BZ#209	ND		ug/l	0.00099	0.00050	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	68		30-150
BZ 198	73		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-11
 Client ID: COMPOSITE 5 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 20:44
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00098	0.00049	1
CI3-BZ#18	ND		ug/l	0.00098	0.00049	1
CI3-BZ#28	ND		ug/l	0.00098	0.00049	1
CI4-BZ#44	ND		ug/l	0.00098	0.00049	1
CI4-BZ#49	ND		ug/l	0.00098	0.00049	1
CI4-BZ#52	0.00063	J	ug/l	0.00098	0.00049	1
CI4-BZ#66	ND		ug/l	0.00098	0.00049	1
CI5-BZ#87	ND		ug/l	0.00098	0.00049	1
CI5-BZ#101	0.00057	J	ug/l	0.00098	0.00049	1
CI5-BZ#105	ND		ug/l	0.00098	0.00049	1
CI5-BZ#118	0.00060	J	ug/l	0.00098	0.00049	1
CI6-BZ#128	ND		ug/l	0.00098	0.00049	1
CI6-BZ#138	0.00062	J	ug/l	0.00098	0.00049	1
CI6-BZ#153	0.00058	J	ug/l	0.00098	0.00049	1
CI7-BZ#170	ND		ug/l	0.00098	0.00049	1
CI7-BZ#180	ND		ug/l	0.00098	0.00049	1
CI7-BZ#183	ND		ug/l	0.00098	0.00049	1
CI7-BZ#184	ND		ug/l	0.00098	0.00049	1
CI7-BZ#187	ND		ug/l	0.00098	0.00049	1
CI8-BZ#195	ND		ug/l	0.00098	0.00049	1
CI9-BZ#206	ND		ug/l	0.00098	0.00049	1
CI10-BZ#209	ND		ug/l	0.00098	0.00049	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	75		30-150
BZ 198	81		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-12
 Client ID: COMPOSITE 5 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 21:18
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00100	0.00050	1
CI3-BZ#18	ND		ug/l	0.00100	0.00050	1
CI3-BZ#28	ND		ug/l	0.00100	0.00050	1
CI4-BZ#44	ND		ug/l	0.00100	0.00050	1
CI4-BZ#49	ND		ug/l	0.00100	0.00050	1
CI4-BZ#52	0.00087	J	ug/l	0.00100	0.00050	1
CI4-BZ#66	ND		ug/l	0.00100	0.00050	1
CI5-BZ#87	ND		ug/l	0.00100	0.00050	1
CI5-BZ#101	0.00051	J	ug/l	0.00100	0.00050	1
CI5-BZ#105	ND		ug/l	0.00100	0.00050	1
CI5-BZ#118	ND		ug/l	0.00100	0.00050	1
CI6-BZ#128	ND		ug/l	0.00100	0.00050	1
CI6-BZ#138	0.00051	J	ug/l	0.00100	0.00050	1
CI6-BZ#153	0.00052	J	ug/l	0.00100	0.00050	1
CI7-BZ#170	ND		ug/l	0.00100	0.00050	1
CI7-BZ#180	ND		ug/l	0.00100	0.00050	1
CI7-BZ#183	ND		ug/l	0.00100	0.00050	1
CI7-BZ#184	ND		ug/l	0.00100	0.00050	1
CI7-BZ#187	ND		ug/l	0.00100	0.00050	1
CI8-BZ#195	ND		ug/l	0.00100	0.00050	1
CI9-BZ#206	ND		ug/l	0.00100	0.00050	1
CI10-BZ#209	ND		ug/l	0.00100	0.00050	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	71		30-150
BZ 198	80		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-13
 Client ID: COMPOSITE 4 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 21:52
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00100	0.00050	1
CI3-BZ#18	0.00092	J	ug/l	0.00100	0.00050	1
CI3-BZ#28	0.00098	J	ug/l	0.00100	0.00050	1
CI4-BZ#44	0.00061	J	ug/l	0.00100	0.00050	1
CI4-BZ#49	0.00114		ug/l	0.00100	0.00050	1
CI4-BZ#52	0.00152		ug/l	0.00100	0.00050	1
CI4-BZ#66	0.00068	J	ug/l	0.00100	0.00050	1
CI5-BZ#87	0.00065	J	ug/l	0.00100	0.00050	1
CI5-BZ#101	0.00166		ug/l	0.00100	0.00050	1
CI5-BZ#105	0.00089	J	ug/l	0.00100	0.00050	1
CI5-BZ#118	0.00160		ug/l	0.00100	0.00050	1
CI6-BZ#128	ND		ug/l	0.00100	0.00050	1
CI6-BZ#138	0.00204		ug/l	0.00100	0.00050	1
CI6-BZ#153	0.00184		ug/l	0.00100	0.00050	1
CI7-BZ#170	0.00063	J	ug/l	0.00100	0.00050	1
CI7-BZ#180	0.00100		ug/l	0.00100	0.00050	1
CI7-BZ#183	ND		ug/l	0.00100	0.00050	1
CI7-BZ#184	ND		ug/l	0.00100	0.00050	1
CI7-BZ#187	0.00050	J	ug/l	0.00100	0.00050	1
CI8-BZ#195	ND		ug/l	0.00100	0.00050	1
CI9-BZ#206	ND		ug/l	0.00100	0.00050	1
CI10-BZ#209	ND		ug/l	0.00100	0.00050	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	72		30-150
BZ 198	71		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-14
 Client ID: COMPOSITE 4 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 22:25
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00104	0.00052	1
CI3-BZ#18	0.00176		ug/l	0.00104	0.00052	1
CI3-BZ#28	0.00349		ug/l	0.00104	0.00052	1
CI4-BZ#44	0.00492		ug/l	0.00104	0.00052	1
CI4-BZ#49	0.00521		ug/l	0.00104	0.00052	1
CI4-BZ#52	0.01300		ug/l	0.00104	0.00052	1
CI4-BZ#66	0.00502		ug/l	0.00104	0.00052	1
CI5-BZ#87	0.00303		ug/l	0.00104	0.00052	1
CI5-BZ#101	0.01010		ug/l	0.00104	0.00052	1
CI5-BZ#105	ND		ug/l	0.00104	0.00052	1
CI5-BZ#118	0.00913		ug/l	0.00104	0.00052	1
CI6-BZ#128	ND		ug/l	0.00104	0.00052	1
CI6-BZ#138	0.01100		ug/l	0.00104	0.00052	1
CI6-BZ#153	0.01130		ug/l	0.00104	0.00052	1
CI7-BZ#170	0.00391		ug/l	0.00104	0.00052	1
CI7-BZ#180	0.00739		ug/l	0.00104	0.00052	1
CI7-BZ#183	0.00199		ug/l	0.00104	0.00052	1
CI7-BZ#184	ND		ug/l	0.00104	0.00052	1
CI7-BZ#187	0.00458		ug/l	0.00104	0.00052	1
CI8-BZ#195	0.00101	J	ug/l	0.00104	0.00052	1
CI9-BZ#206	0.00163		ug/l	0.00104	0.00052	1
CI10-BZ#209	0.00057	J	ug/l	0.00104	0.00052	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	87		30-150
BZ 198	88		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-15
 Client ID: COMPOSITE 4 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 22:59
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00227	0.00114	1
CI3-BZ#18	ND		ug/l	0.00227	0.00114	1
CI3-BZ#28	ND		ug/l	0.00227	0.00114	1
CI4-BZ#44	ND		ug/l	0.00227	0.00114	1
CI4-BZ#49	ND		ug/l	0.00227	0.00114	1
CI4-BZ#52	0.00129	J	ug/l	0.00227	0.00114	1
CI4-BZ#66	ND		ug/l	0.00227	0.00114	1
CI5-BZ#87	ND		ug/l	0.00227	0.00114	1
CI5-BZ#101	0.00145	J	ug/l	0.00227	0.00114	1
CI5-BZ#105	ND		ug/l	0.00227	0.00114	1
CI5-BZ#118	ND		ug/l	0.00227	0.00114	1
CI6-BZ#128	ND		ug/l	0.00227	0.00114	1
CI6-BZ#138	ND		ug/l	0.00227	0.00114	1
CI6-BZ#153	ND		ug/l	0.00227	0.00114	1
CI7-BZ#170	ND		ug/l	0.00227	0.00114	1
CI7-BZ#180	ND		ug/l	0.00227	0.00114	1
CI7-BZ#183	ND		ug/l	0.00227	0.00114	1
CI7-BZ#184	ND		ug/l	0.00227	0.00114	1
CI7-BZ#187	ND		ug/l	0.00227	0.00114	1
CI8-BZ#195	ND		ug/l	0.00227	0.00114	1
CI9-BZ#206	ND		ug/l	0.00227	0.00114	1
CI10-BZ#209	ND		ug/l	0.00227	0.00114	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	73		30-150
BZ 198	87		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-16
 Client ID: COMPOSITE 3 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/26/18 23:33
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00100	0.00050	1
CI3-BZ#18	ND		ug/l	0.00100	0.00050	1
CI3-BZ#28	ND		ug/l	0.00100	0.00050	1
CI4-BZ#44	ND		ug/l	0.00100	0.00050	1
CI4-BZ#49	ND		ug/l	0.00100	0.00050	1
CI4-BZ#52	0.00073	J	ug/l	0.00100	0.00050	1
CI4-BZ#66	ND		ug/l	0.00100	0.00050	1
CI5-BZ#87	ND		ug/l	0.00100	0.00050	1
CI5-BZ#101	ND		ug/l	0.00100	0.00050	1
CI5-BZ#105	ND		ug/l	0.00100	0.00050	1
CI5-BZ#118	ND		ug/l	0.00100	0.00050	1
CI6-BZ#128	ND		ug/l	0.00100	0.00050	1
CI6-BZ#138	ND		ug/l	0.00100	0.00050	1
CI6-BZ#153	0.00050	J	ug/l	0.00100	0.00050	1
CI7-BZ#170	ND		ug/l	0.00100	0.00050	1
CI7-BZ#180	ND		ug/l	0.00100	0.00050	1
CI7-BZ#183	ND		ug/l	0.00100	0.00050	1
CI7-BZ#184	ND		ug/l	0.00100	0.00050	1
CI7-BZ#187	ND		ug/l	0.00100	0.00050	1
CI8-BZ#195	ND		ug/l	0.00100	0.00050	1
CI9-BZ#206	ND		ug/l	0.00100	0.00050	1
CI10-BZ#209	ND		ug/l	0.00100	0.00050	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	73		30-150
BZ 198	69		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-17
 Client ID: COMPOSITE 3 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/27/18 01:15
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00098	0.00049	1
CI3-BZ#18	ND		ug/l	0.00098	0.00049	1
CI3-BZ#28	ND		ug/l	0.00098	0.00049	1
CI4-BZ#44	ND		ug/l	0.00098	0.00049	1
CI4-BZ#49	ND		ug/l	0.00098	0.00049	1
CI4-BZ#52	ND		ug/l	0.00098	0.00049	1
CI4-BZ#66	ND		ug/l	0.00098	0.00049	1
CI5-BZ#87	ND		ug/l	0.00098	0.00049	1
CI5-BZ#101	ND		ug/l	0.00098	0.00049	1
CI5-BZ#105	ND		ug/l	0.00098	0.00049	1
CI5-BZ#118	ND		ug/l	0.00098	0.00049	1
CI6-BZ#128	ND		ug/l	0.00098	0.00049	1
CI6-BZ#138	ND		ug/l	0.00098	0.00049	1
CI6-BZ#153	ND		ug/l	0.00098	0.00049	1
CI7-BZ#170	ND		ug/l	0.00098	0.00049	1
CI7-BZ#180	ND		ug/l	0.00098	0.00049	1
CI7-BZ#183	ND		ug/l	0.00098	0.00049	1
CI7-BZ#184	ND		ug/l	0.00098	0.00049	1
CI7-BZ#187	ND		ug/l	0.00098	0.00049	1
CI8-BZ#195	ND		ug/l	0.00098	0.00049	1
CI9-BZ#206	ND		ug/l	0.00098	0.00049	1
CI10-BZ#209	ND		ug/l	0.00098	0.00049	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	78		30-150
BZ 198	76		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-18
 Client ID: COMPOSITE 3 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/27/18 01:49
 Analyst: GP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PCB Congeners (RIM List) - Mansfield Lab						
CI2-BZ#8	ND		ug/l	0.00103	0.00052	1
CI3-BZ#18	0.00134		ug/l	0.00103	0.00052	1
CI3-BZ#28	0.00092	J	ug/l	0.00103	0.00052	1
CI4-BZ#44	ND		ug/l	0.00103	0.00052	1
CI4-BZ#49	0.00227		ug/l	0.00103	0.00052	1
CI4-BZ#52	0.00546		ug/l	0.00103	0.00052	1
CI4-BZ#66	0.00175		ug/l	0.00103	0.00052	1
CI5-BZ#87	0.00103		ug/l	0.00103	0.00052	1
CI5-BZ#101	0.00335		ug/l	0.00103	0.00052	1
CI5-BZ#105	ND		ug/l	0.00103	0.00052	1
CI5-BZ#118	0.00272		ug/l	0.00103	0.00052	1
CI6-BZ#128	ND		ug/l	0.00103	0.00052	1
CI6-BZ#138	0.00357		ug/l	0.00103	0.00052	1
CI6-BZ#153	0.00328		ug/l	0.00103	0.00052	1
CI7-BZ#170	0.00072	J	ug/l	0.00103	0.00052	1
CI7-BZ#180	0.00216		ug/l	0.00103	0.00052	1
CI7-BZ#183	0.00056	J	ug/l	0.00103	0.00052	1
CI7-BZ#184	ND		ug/l	0.00103	0.00052	1
CI7-BZ#187	0.00148		ug/l	0.00103	0.00052	1
CI8-BZ#195	ND		ug/l	0.00103	0.00052	1
CI9-BZ#206	0.00065	J	ug/l	0.00103	0.00052	1
CI10-BZ#209	ND		ug/l	0.00103	0.00052	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	75		30-150
BZ 198	76		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 11/26/18 12:29
Analyst: GP

Extraction Method: EPA 3510C
Extraction Date: 11/23/18 12:16

Parameter	Result	Qualifier	Units	RL	MDL
PCB Congeners (RIM List) - Mansfield Lab for sample(s): 01-18 Batch: WG1182112-1					
C12-BZ#8	ND		ug/l	0.00100	0.00050
C13-BZ#18	ND		ug/l	0.00100	0.00050
C13-BZ#28	ND		ug/l	0.00100	0.00050
C14-BZ#44	ND		ug/l	0.00100	0.00050
C14-BZ#49	ND		ug/l	0.00100	0.00050
C14-BZ#52	ND		ug/l	0.00100	0.00050
C14-BZ#66	ND		ug/l	0.00100	0.00050
C15-BZ#87	ND		ug/l	0.00100	0.00050
C15-BZ#101	ND		ug/l	0.00100	0.00050
C15-BZ#105	ND		ug/l	0.00100	0.00050
C15-BZ#118	ND		ug/l	0.00100	0.00050
C16-BZ#128	ND		ug/l	0.00100	0.00050
C16-BZ#138	ND		ug/l	0.00100	0.00050
C16-BZ#153	ND		ug/l	0.00100	0.00050
C17-BZ#170	ND		ug/l	0.00100	0.00050
C17-BZ#180	ND		ug/l	0.00100	0.00050
C17-BZ#183	ND		ug/l	0.00100	0.00050
C17-BZ#184	ND		ug/l	0.00100	0.00050
C17-BZ#187	ND		ug/l	0.00100	0.00050
C18-BZ#195	ND		ug/l	0.00100	0.00050
C19-BZ#206	ND		ug/l	0.00100	0.00050
C110-BZ#209	ND		ug/l	0.00100	0.00050

Surrogate	%Recovery	Qualifier	Acceptance Criteria
DBOB	65		30-150
BZ 198	78		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1844003

Project Number: 60588790 TASK 6.0

Report Date: 11/28/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 Batch: WG1182112-2 WG1182112-3								
Cl2-BZ#8	55		57		50-120	4		30
Cl3-BZ#18	58		58		50-120	0		30
Cl3-BZ#28	69		71		50-120	3		30
Cl4-BZ#44	80		84		50-120	5		30
Cl4-BZ#49	67		72		50-120	7		30
Cl4-BZ#52	71		72		50-120	1		30
Cl4-BZ#66	83		86		50-120	4		30
Cl5-BZ#87	83		87		50-120	5		30
Cl5-BZ#101	80		82		50-120	2		30
Cl5-BZ#105	88		90		50-120	2		30
Cl5-BZ#118	88		88		50-120	0		30
Cl6-BZ#128	79		81		50-120	3		30
Cl6-BZ#138	80		82		50-120	2		30
Cl6-BZ#153	82		84		50-120	2		30
Cl7-BZ#170	76		78		50-120	3		30
Cl7-BZ#180	73		75		50-120	3		30
Cl7-BZ#183	72		74		50-120	3		30
Cl7-BZ#184	74		76		50-120	3		30
Cl7-BZ#187	74		76		50-120	3		30
Cl8-BZ#195	77		81		50-120	5		30
Cl9-BZ#206	74		74		50-120	0		30
Cl10-BZ#209	69		70		50-120	1		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 Batch: WG1182112-2 WG1182112-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
DBOB	63		66		30-150
BZ 198	81		80		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1844003

Project Number: 60588790 TASK 6.0

Report Date: 11/28/18

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1182112-4 WG1182112-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
CI2-BZ#8	ND	0.102	0.067	66		0.063	65		50-120	6		30
CI3-BZ#18	ND	0.102	0.059	58		0.066	67		50-120	11		30
CI3-BZ#28	ND	0.102	0.070	69		0.077	79		50-120	10		30
CI4-BZ#44	ND	0.102	0.078	76		0.084	86		50-120	8		30
CI4-BZ#49	ND	0.102	0.067	66		0.077	78		50-120	13		30
CI4-BZ#52	0.001J	0.102	0.071	69		0.085	86		50-120	18		30
CI4-BZ#66	ND	0.102	0.077	75		0.078	79		50-120	1		30
CI5-BZ#87	ND	0.102	0.076	75		0.081	82		50-120	6		30
CI5-BZ#101	ND	0.102	0.074	72		0.079	80		50-120	7		30
CI5-BZ#105	ND	0.102	0.078	77		0.081	82		50-120	3		30
CI5-BZ#118	ND	0.102	0.076	74		0.077	79		50-120	2		30
CI6-BZ#128	ND	0.102	0.074	73		0.073	75		50-120	2		30
CI6-BZ#138	ND	0.102	0.073	71		0.076	78		50-120	5		30
CI6-BZ#153	0.001J	0.102	0.073	72		0.075	77		50-120	2		30
CI7-BZ#170	ND	0.102	0.075	73		0.077	78		50-120	2		30
CI7-BZ#180	ND	0.102	0.065	64		0.065	67		50-120	0		30
CI7-BZ#183	ND	0.102	0.067	66		0.068	69		50-120	0		30
CI7-BZ#184	ND	0.102	0.068	67		0.068	70		50-120	0		30
CI7-BZ#187	ND	0.102	0.069	67		0.070	71		50-120	1		30
CI8-BZ#195	ND	0.102	0.078	77		0.077	79		50-120	1		30
CI9-BZ#206	ND	0.102	0.071	69		0.070	72		50-120	0		30
CI10-BZ#209	ND	0.102	0.066	65		0.064	65		50-120	4		30

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PCB Congeners (RIM List) - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1182112-4 WG1182112-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
BZ 198	66		78		30-150
DBOB	64		75		30-150



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Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-01
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 18:51
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0011	0.0011	1	A
Chloropyrifos	ND		ug/l	0.0011	0.0011	1	A
Heptachlor epoxide	ND		ug/l	0.0011	0.0011	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0277	0.0138	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	60		30-150	A
BZ 198	71		30-150	A
DBOB	52		30-150	B
BZ 198	77		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-02
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 19:25
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0255	0.0127	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	66		30-150	A
BZ 198	78		30-150	A
DBOB	60		30-150	B
BZ 198	84		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-03
 Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 19:59
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0274	0.0137	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	51		30-150	A
BZ 198	51		30-150	A
DBOB	44		30-150	B
BZ 198	55		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-04
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 20:34
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0263	0.0131	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	68		30-150	A
BZ 198	83		30-150	A
DBOB	59		30-150	B
BZ 198	90		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-05
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 21:08
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0274	0.0137	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	68		30-150	A
BZ 198	78		30-150	A
DBOB	61		30-150	B
BZ 198	84		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-06
 Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 11:40
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 21:42
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0268	0.0134	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	66		30-150	A
BZ 198	75		30-150	A
DBOB	59		30-150	B
BZ 198	82		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-07
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 22:16
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0255	0.0127	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	A
BZ 198	78		30-150	A
DBOB	59		30-150	B
BZ 198	87		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-08
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 22:50
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0274	0.0137	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	61		30-150	A
BZ 198	73		30-150	A
DBOB	53		30-150	B
BZ 198	79		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-09
 Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 09:20
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 23:24
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	74		30-150	A
BZ 198	79		30-150	A
DBOB	65		30-150	B
BZ 198	87		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-10
 Client ID: COMPOSITE 5 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/26/18 23:58
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Dieldrin	ND		ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0247	0.0123	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	69		30-150	A
BZ 198	63		30-150	A
DBOB	72		30-150	B
BZ 198	150		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-11
 Client ID: COMPOSITE 5 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 00:32
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Dieldrin	ND		ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	ND		ug/l	0.0004	0.0004	1	A
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0245	0.0122	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	A
BZ 198	70		30-150	A
DBOB	87		30-150	B
BZ 198	184	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-12
 Client ID: COMPOSITE 5 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 15:25
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 01:06
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0016		ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0025		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0025		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	59		30-150	A
BZ 198	59		30-150	A
DBOB	93		30-150	B
BZ 198	148		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-13
 Client ID: COMPOSITE 4 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 01:40
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0016		ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0045	P	ug/l	0.0005	0.0005	1	B
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0029		ug/l	0.0005	0.0005	1	B
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	62		30-150	A
BZ 198	62		30-150	A
DBOB	77		30-150	B
BZ 198	291	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-14
 Client ID: COMPOSITE 4 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 02:14
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	0.0046		ug/l	0.0005	0.0005	1	B
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0068	P	ug/l	0.0005	0.0005	1	B
Dieldrin	0.0020	IP	ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0049	P	ug/l	0.0005	0.0005	1	A
4,4'-DDT	0.0016	IP	ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0260	0.0130	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	78		30-150	A
BZ 198	64		30-150	A
DBOB	76		30-150	B
BZ 198	360	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-15
 Client ID: COMPOSITE 4 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 13:10
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 02:48
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0011	0.0011	1	A
Heptachlor	ND		ug/l	0.0011	0.0011	1	A
Aldrin	ND		ug/l	0.0022	0.0022	1	A
Chloropyrifos	ND		ug/l	0.0022	0.0022	1	A
Heptachlor epoxide	ND		ug/l	0.0022	0.0022	1	B
trans-Chlordane	ND		ug/l	0.0011	0.0011	1	A
Endosulfan I	0.0018	P	ug/l	0.0011	0.0011	1	A
cis-Chlordane	ND		ug/l	0.0011	0.0011	1	B
Dieldrin	ND		ug/l	0.0011	0.0011	1	A
Endrin	ND		ug/l	0.0011	0.0011	1	A
Endosulfan II	ND		ug/l	0.0011	0.0011	1	A
4,4'-DDT	ND		ug/l	0.0011	0.0011	1	A
Toxaphene	ND		ug/l	0.0568	0.0284	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	73		30-150	A
BZ 198	77		30-150	A
DBOB	62		30-150	B
BZ 198	82		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-16
 Client ID: COMPOSITE 3 ELUTRIATE-REP1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 03:22
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Dieldrin	ND		ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	0.0028		ug/l	0.0005	0.0005	1	B
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0250	0.0125	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	59		30-150	A
BZ 198	51		30-150	A
DBOB	76		30-150	B
BZ 198	271	Q	30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-17
 Client ID: COMPOSITE 3 ELUTRIATE-REP2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 18:49
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0004	0.0004	1	A
Heptachlor	ND		ug/l	0.0004	0.0004	1	A
Aldrin	ND		ug/l	0.0009	0.0009	1	A
Chloropyrifos	ND		ug/l	0.0009	0.0009	1	A
Heptachlor epoxide	ND		ug/l	0.0009	0.0009	1	B
trans-Chlordane	ND		ug/l	0.0004	0.0004	1	A
Endosulfan I	ND		ug/l	0.0004	0.0004	1	A
cis-Chlordane	0.0059	P	ug/l	0.0004	0.0004	1	B
Dieldrin	ND		ug/l	0.0004	0.0004	1	A
Endrin	ND		ug/l	0.0004	0.0004	1	A
Endosulfan II	0.0041	P	ug/l	0.0004	0.0004	1	B
4,4'-DDT	ND		ug/l	0.0004	0.0004	1	A
Toxaphene	ND		ug/l	0.0245	0.0122	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	64		30-150	A
BZ 198	55		30-150	A
DBOB	73		30-150	B
BZ 198	303	Q	30-150	B

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

SAMPLE RESULTS

Lab ID: L1844003-18
 Client ID: COMPOSITE 3 ELUTRIATE-REP3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/26/18 16:15
 Date Received: 10/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8081B
 Analytical Date: 11/27/18 19:23
 Analyst: DP

Extraction Method: EPA 3510C
 Extraction Date: 11/23/18 12:21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
gamma-BHC	ND		ug/l	0.0005	0.0005	1	A
Heptachlor	ND		ug/l	0.0005	0.0005	1	A
Aldrin	ND		ug/l	0.0010	0.0010	1	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	1	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	1	B
trans-Chlordane	ND		ug/l	0.0005	0.0005	1	A
Endosulfan I	ND		ug/l	0.0005	0.0005	1	A
cis-Chlordane	0.0060	P	ug/l	0.0005	0.0005	1	B
Dieldrin	0.0012	IP	ug/l	0.0005	0.0005	1	A
Endrin	ND		ug/l	0.0005	0.0005	1	A
Endosulfan II	ND		ug/l	0.0005	0.0005	1	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	1	A
Toxaphene	ND		ug/l	0.0257	0.0128	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	77		30-150	A
BZ 198	62		30-150	A
DBOB	65		30-150	B
BZ 198	116		30-150	B



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 11/26/18 17:09
Analyst: DP

Extraction Method: EPA 3510C
Extraction Date: 11/23/18 12:20

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-18 Batch: WG1182113-1						
gamma-BHC	ND		ug/l	0.0005	0.0005	A
Heptachlor	ND		ug/l	0.0005	0.0005	A
Aldrin	ND		ug/l	0.0010	0.0010	A
Chloropyrifos	ND		ug/l	0.0010	0.0010	A
trans-Chlordane	ND		ug/l	0.0005	0.0005	A
Endosulfan I	ND		ug/l	0.0005	0.0005	A
cis-Chlordane	ND		ug/l	0.0005	0.0005	A
Dieldrin	ND		ug/l	0.0005	0.0005	A
Endrin	ND		ug/l	0.0005	0.0005	A
Endosulfan II	ND		ug/l	0.0005	0.0005	A
4,4'-DDT	ND		ug/l	0.0005	0.0005	A
Toxaphene	ND		ug/l	0.0250	0.0125	A
Heptachlor epoxide	ND		ug/l	0.0010	0.0010	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	A
BZ 198	70		30-150	A
DBOB	60		30-150	B
BZ 198	74		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1182113-2 WG1182113-3									
gamma-BHC	61		58		50-120	6		30	A
Heptachlor	39	Q	37	Q	50-120	3		30	A
Aldrin	37	Q	34	Q	50-120	9		30	A
Chloropyrifos	58		61		50-120	5		30	A
trans-Chlordane	80		75		50-120	6		30	A
Endosulfan I	85		78		50-120	9		30	A
cis-Chlordane	80		75		50-120	7		30	A
Dieldrin	99		90		50-120	9		30	A
Endrin	89		83		50-120	7		30	A
4,4'-DDT	88		82		50-120	8		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	65		63		30-150	A
BZ 198	83		72		30-150	A
DBOB	61		60		30-150	B
BZ 198	90		77		30-150	B



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1182113-2 WG1182113-3									
Heptachlor epoxide	76		70		50-120	8		30	B
Endosulfan II	82		77		50-120	6		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	65		63		30-150	A
BZ 198	83		72		30-150	A
DBOB	61		60		30-150	B
BZ 198	90		77		30-150	B



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1182113-4 WG1182113-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1													
gamma-BHC	ND	0.102	0.0902	88		0.0835	85		50-120	8		30	A
Heptachlor	ND	0.102	0.0674	66		0.0643	66		50-120	5		30	A
Aldrin	ND	0.102	0.0575	56		0.0502	51		50-120	14		30	A
Chloropyrifos	ND	0.102	0.0986	97		0.0969	99		50-120	2		30	A
Heptachlor epoxide	ND	0.102	0.0826	81		0.0771	79		50-120	7		30	B
trans-Chlordane	ND	0.102	0.0861	84		0.0855	87		50-120	1		30	A
Endosulfan I	ND	0.102	0.0916	90		0.0863	88		50-120	6		30	A
cis-Chlordane	ND	0.102	0.0827	81		0.0767	78		50-120	8		30	A
Dieldrin	ND	0.102	0.1076	105		0.0976	100		50-120	10		30	A
Endrin	ND	0.102	0.0992	97		0.0915	93		50-120	8		30	A
Endosulfan II	0.0028	0.102	0.0923	88		0.0857	85		50-120	7		30	B
4,4'-DDT	ND	0.102	0.0856	84		0.0840	86		50-120	2		30	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
BZ 198	72		71		30-150	A
DBOB	77		82		30-150	A
BZ 198	225	Q	231	Q	30-150	B
DBOB	77		74		30-150	B



METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-01

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00117		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:48	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Chromium, Total	0.00011	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Copper, Total	0.00060		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Lead, Total	0.00043		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:32	EPA 7474	1,7474	BV
Nickel, Total	0.00017	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:13	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM
Zinc, Total	0.00094	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 09:53	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-02

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00105		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:50	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Chromium, Total	0.00013	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Copper, Total	0.00035		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Lead, Total	0.00035		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:35	EPA 7474	1,7474	BV
Nickel, Total	0.00014	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Selenium, Total	0.00011	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:21	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM
Zinc, Total	0.00073	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 09:57	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-03

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00115		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:52	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Chromium, Total	0.00012	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Copper, Total	0.00075		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Lead, Total	0.00044		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:37	EPA 7474	1,7474	BV
Nickel, Total	0.00026	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:23	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM
Zinc, Total	0.00138	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:01	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-04

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00102		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:54	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Chromium, Total	0.00012	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Copper, Total	0.00093		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Lead, Total	0.00030		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:39	EPA 7474	1,7474	BV
Nickel, Total	0.00039	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:25	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM
Zinc, Total	0.00157	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:05	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-05

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00110		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:56	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Chromium, Total	0.00008	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Copper, Total	0.00102		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Lead, Total	0.00043		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:42	EPA 7474	1,7474	BV
Nickel, Total	0.00046		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:27	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM
Zinc, Total	0.00227		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:09	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-06

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00115		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:58	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Chromium, Total	0.00009	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Copper, Total	0.00090		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Lead, Total	0.00028		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:50	EPA 7474	1,7474	BV
Nickel, Total	0.00026	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:29	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM
Zinc, Total	0.00135	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:14	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-07

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00112		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 09:00	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Chromium, Total	0.00011	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Copper, Total	0.00064		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Lead, Total	0.00030		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:53	EPA 7474	1,7474	BV
Nickel, Total	0.00019	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:31	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM
Zinc, Total	0.00140	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:18	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-08

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00108		mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 09:02	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Chromium, Total	0.00010	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Copper, Total	0.00114		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Lead, Total	0.00064		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:55	EPA 7474	1,7474	BV
Nickel, Total	0.00026	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:33	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM
Zinc, Total	0.00300		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 10:55	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-09

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.00093	J	mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 09:24	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Chromium, Total	0.00008	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Copper, Total	0.00076		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Lead, Total	0.00011	J	mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:58	EPA 7474	1,7474	BV
Nickel, Total	0.00023	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Selenium, Total	0.00016	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:04	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM
Zinc, Total	0.00103	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 11:00	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-10

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03230		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 09:26	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Chromium, Total	0.00020		mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Copper, Total	0.00024		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Lead, Total	0.00017	J	mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:00	EPA 7474	1,7474	BV
Nickel, Total	ND		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Selenium, Total	0.00020	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:06	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM
Zinc, Total	ND		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 11:04	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-11

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03310		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 09:28	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Chromium, Total	0.00064		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Copper, Total	0.00030		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Lead, Total	0.00020		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:08	EPA 7474	1,7474	BV
Nickel, Total	0.00016	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Selenium, Total	0.00021	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:08	NA	86,1632A(M)	BV
Silver, Total	0.00003	J	mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM
Zinc, Total	ND		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:12	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-12

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03523		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 09:30	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Chromium, Total	0.00022		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Copper, Total	0.00028		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Lead, Total	0.00022		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:10	EPA 7474	1,7474	BV
Nickel, Total	0.00018	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Selenium, Total	0.00019	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:10	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM
Zinc, Total	ND		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:16	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-13

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.04418		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 09:32	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Chromium, Total	0.00065		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Copper, Total	0.00115		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Lead, Total	0.00097		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:13	EPA 7474	1,7474	BV
Nickel, Total	0.00025	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Selenium, Total	0.00021	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:12	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM
Zinc, Total	0.00184	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:20	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-14

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.04159		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 11:06	NA	86,1632A(M)	BV
Cadmium, Total	0.00004		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Chromium, Total	0.00113		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Copper, Total	0.00195		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Lead, Total	0.00152		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:15	EPA 7474	1,7474	BV
Nickel, Total	0.00055		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Selenium, Total	0.00022	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:19	NA	86,1632A(M)	BV
Silver, Total	0.00003	J	mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM
Zinc, Total	0.00380		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:24	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-15

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.02832		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 11:08	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Chromium, Total	0.00030		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Copper, Total	0.00061		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Lead, Total	0.00050		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:18	EPA 7474	1,7474	BV
Nickel, Total	0.00051		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Selenium, Total	0.00025	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:21	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM
Zinc, Total	0.00110	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:28	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-16

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.03944		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 09:10	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Chromium, Total	0.00194		mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Copper, Total	ND		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Lead, Total	ND		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:17	EPA 7474	1,7474	BV
Nickel, Total	ND		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Selenium, Total	0.00016	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:05	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM
Zinc, Total	0.00198	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 09:49	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-17

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.02234		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 11:10	NA	86,1632A(M)	BV
Cadmium, Total	0.00001	J	mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Chromium, Total	0.00067		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Copper, Total	0.00079		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Lead, Total	0.00060		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:20	EPA 7474	1,7474	BV
Nickel, Total	0.00043		mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Selenium, Total	0.00019	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:23	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM
Zinc, Total	0.00113	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:32	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-18

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	0.02627		mg/l	0.00500	0.00047	5	11/19/18 09:28	11/20/18 11:12	NA	86,1632A(M)	BV
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Chromium, Total	0.00067		mg/l	0.00010	0.00003	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Copper, Total	0.00060		mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Lead, Total	0.00042		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 10:23	EPA 7474	1,7474	BV
Nickel, Total	0.00035	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Selenium, Total	0.00018	J	mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 15:25	NA	86,1632A(M)	BV
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM
Zinc, Total	0.00076	J	mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 12:36	CHELATION	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1177006-1										
Cadmium, Total	ND		mg/l	0.00004	0.00001	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Chromium, Total	0.00017	J	mg/l	0.00020	0.00003	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Copper, Total	0.00017	J	mg/l	0.00020	0.00007	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Lead, Total	ND		mg/l	0.00020	0.00006	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Nickel, Total	0.00014	J	mg/l	0.00040	0.00011	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Silver, Total	ND		mg/l	0.00008	0.00003	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM
Zinc, Total	ND		mg/l	0.00200	0.00068	10	11/20/18 14:01	11/21/18 08:50	1,6020B	AM

Prep Information

Digestion Method: CHELATION

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180588-1										
Mercury, Total	ND		mg/l	0.00005	0.00001	1	11/19/18 07:17	11/19/18 09:12	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180838-1										
Selenium, Total	ND		mg/l	0.00056	0.00009	1	11/19/18 13:13	11/20/18 13:01	86,1632A(M)	BV

Prep Information

Digestion Method:



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1844003

Project Number: 60588790 TASK 6.0

Report Date: 11/28/18

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1180844-1									
Arsenic, Total	ND	mg/l	0.00100	0.00009	1	11/19/18 09:28	11/20/18 08:44	86,1632A(M)	BV

Prep Information

Digestion Method:



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1177006-2								
Cadmium, Total	84		-		80-120	-		20
Chromium, Total	1	Q	-		80-120	-		20
Copper, Total	79	Q	-		80-120	-		20
Lead, Total	87		-		80-120	-		20
Nickel, Total	83		-		80-120	-		20
Silver, Total	0	Q	-		80-120	-		20
Zinc, Total	81		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180588-2 SRM Lot Number: HPHGAF								
Mercury, Total	93		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180838-2 SRM Lot Number: A2HGAF								
Selenium, Total	97		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1180844-2 SRM Lot Number: A2HGAF								
Arsenic, Total	99		-		80-120	-		20



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1177006-3 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
Cadmium, Total	0.00001J	0.051	0.01246	24	Q	-	-		75-125	-		20
Chromium, Total	0.00194	0.2	0.0260	12	Q	-	-		75-125	-		20
Copper, Total	ND	0.25	ND	0	Q	-	-		75-125	-		20
Lead, Total	ND	0.51	0.0333	7	Q	-	-		75-125	-		20
Nickel, Total	ND	0.5	0.00014J	0	Q	-	-		75-125	-		20
Silver, Total	ND	0.05	0.00007J	0	Q	-	-		75-125	-		20
Zinc, Total	0.00198J	0.5	0.110	22	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180588-3 WG1180588-4 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
Mercury, Total	ND	0.0025	0.00195	78	Q	0.00195	78	Q	80-120	0		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180838-3 WG1180838-4 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
Selenium, Total	0.00016J	0.00556	0.00544	98		0.00575	104		75-125	6		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180844-3 WG1180844-4 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1												
Arsenic, Total	0.03944	0.01	0.04737	79		0.04843	90		75-125	2		20

Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1177006-4 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1						
Cadmium, Total	0.00001J	ND	mg/l	NC		20
Chromium, Total	0.00194	0.00165	mg/l	16		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.00198J	0.00161J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180588-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180838-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1						
Selenium, Total	0.00016J	0.00013J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1180844-5 QC Sample: L1844003-16 Client ID: COMPOSITE 3 ELUTRIATE-REP1						
Arsenic, Total	0.03944	0.04080	mg/l	3		20



INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-01

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:26	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-02

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:26	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-03

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 3 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:26	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-04

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:27	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-05

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:27	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-06

Date Collected: 10/26/18 11:40

Client ID: COMPOSITE 5 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:27	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-07

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:28	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-08

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:29	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-09

Date Collected: 10/26/18 09:20

Client ID: COMPOSITE 4 ELUTRIATE BLANK-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:29	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-10

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:30	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-11

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:33	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-12

Date Collected: 10/26/18 15:25

Client ID: COMPOSITE 5 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:33	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-13

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:33	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-14

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:34	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-15

Date Collected: 10/26/18 13:10

Client ID: COMPOSITE 4 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:34	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-16

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP1

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:34	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-17

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP2

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:35	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**SAMPLE RESULTS**

Lab ID: L1844003-18

Date Collected: 10/26/18 16:15

Client ID: COMPOSITE 3 ELUTRIATE-REP3

Date Received: 10/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:35	121,3500CR-B	MA



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1844003

Project Number: 60588790 TASK 6.0

Report Date: 11/28/18

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-18 Batch: WG1172938-1									
Chromium, Hexavalent	ND	mg/l	0.010	0.003	1	10/27/18 04:45	10/27/18 05:19	121,3500CR-B	MA



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1844003

Project Number: 60588790 TASK 6.0

Report Date: 11/28/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-18 Batch: WG1172938-2								
Chromium, Hexavalent	100		-		85-115	-		20



Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

<u>Parameter</u>	<u>Native Sample</u>	<u>MS Added</u>	<u>MS Found</u>	<u>MS %Recovery</u>	<u>MSD Qual</u>	<u>MSD Found</u>	<u>MSD %Recovery</u>	<u>MSD Qual</u>	<u>Recovery Limits</u>	<u>RPD</u>	<u>RPD Qual</u>	<u>RPD Limits</u>
General Chemistry - Westborough Lab Associated sample(s): 01-18 QC Batch ID: WG1172938-4 QC Sample: L1844003-18 Client ID: COMPOSITE 3 ELUTRIATE-REP3												
Chromium, Hexavalent	ND	0.1	0.099	99		-	-		85-115	-		20

Lab Duplicate Analysis*Batch Quality Control***Project Name:** NEW HAVEN HARBOR SUPPLEMENTAL**Project Number:** 60588790 TASK 6.0**Lab Number:** L1844003**Report Date:** 11/28/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-18 QC Batch ID: WG1172938-3 QC Sample: L1844003-18 Client ID: COMPOSITE 3 ELUTRIATE-REP3						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A1	Absent
B1	Absent
C1	Absent
D1	Absent
E	Absent
E1	Absent
F	Absent
F1	Absent
G	Absent
G1	Absent
H1	Absent
I	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-01A	Plastic 950ml HNO3 preserved	E	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-01B	Plastic 950ml HNO3 preserved	E	<2	<2	2.7	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-01C	Plastic 950ml unpreserved	E	7	7	2.7	Y	Absent		HEXCR-3500(1)
L1844003-01D	Amber 1000ml unpreserved	E	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1844003-01E	Amber 1000ml unpreserved	E	7	7	2.7	Y	Absent		A2-RIM-8270(7)
L1844003-01F	Amber 1000ml unpreserved	E	7	7	2.7	Y	Absent		A2-RIM-PEST-ELUT(7)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-01G	Amber 1000ml unpreserved	E	7	7	2.7	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-02A	Plastic 950ml HNO3 preserved	F	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-02B	Plastic 950ml HNO3 preserved	F	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-02C	Plastic 950ml unpreserved	F	7	7	2.4	Y	Absent		HEXCR-3500(1)
L1844003-02D	Amber 1000ml unpreserved	F	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1844003-02E	Amber 1000ml unpreserved	F	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1844003-02F	Amber 1000ml unpreserved	F	7	7	2.4	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-02G	Amber 1000ml unpreserved	F	7	7	2.4	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-03A	Plastic 950ml HNO3 preserved	G	<2	<2	3.5	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-03B	Plastic 950ml HNO3 preserved	G	<2	<2	3.5	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-03C	Plastic 950ml unpreserved	G	7	7	3.5	Y	Absent		HEXCR-3500(1)
L1844003-03D	Amber 1000ml unpreserved	G	7	7	3.5	Y	Absent		A2-RIM-8270(7)
L1844003-03E	Amber 1000ml unpreserved	G	7	7	3.5	Y	Absent		A2-RIM-8270(7)
L1844003-03F	Amber 1000ml unpreserved	G	7	7	3.5	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-03G	Amber 1000ml unpreserved	I	7	7	2.8	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-04A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)

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Serial_No:11281815:07
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-04B	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-04C	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-04D	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1844003-04E	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1844003-04F	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-04G	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-05A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-05B	Plastic 950ml HNO3 preserved	C1	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-05C	Plastic 950ml HNO3 preserved	C1	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-05D	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1844003-05E	Amber 1000ml unpreserved	E1	7	7	2.3	Y	Absent		A2-RIM-8270(7)
L1844003-05F	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-05G	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-06A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-06B	Plastic 950ml HNO3 preserved	C1	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)

*Values in parentheses indicate holding time in days



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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-06C	Plastic 950ml HNO3 preserved	C1	<2	<2	2.4	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-06D	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1844003-06E	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-8270(7)
L1844003-06F	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-06G	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-07A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-07B	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-07C	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-07D	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-07E	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-07F	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-07G	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-08A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-08B	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-08C	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-08D	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-08E	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-08F	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-08G	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-09A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-09B	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-09C	Plastic 950ml HNO3 preserved	E1	<2	<2	2.3	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-09D	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-09E	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-09F	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-09G	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-10A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-10B	Plastic 950ml HNO3 preserved	A1	<2	<2	2.5	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-10C	Plastic 950ml HNO3 preserved	A1	<2	<2	2.5	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-10D	Amber 1000ml unpreserved	A1	7	7	2.5	Y	Absent		A2-RIM-8270(7)
L1844003-10E	Amber 1000ml unpreserved	A1	7	7	2.5	Y	Absent		A2-RIM-8270(7)
L1844003-10F	Amber 1000ml unpreserved	A1	7	7	2.5	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-10G	Amber 1000ml unpreserved	A1	7	7	2.5	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-11A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)



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Container Information

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L1844003-11B	Plastic 950ml HNO3 preserved	H1	<2	<2	2.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-11C	Plastic 950ml HNO3 preserved	H1	<2	<2	2.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-11D	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-11E	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-11F	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-11G	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-12A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-12B	Plastic 950ml HNO3 preserved	H1	<2	<2	2.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-12C	Plastic 950ml HNO3 preserved	H1	<2	<2	2.1	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-12D	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-12E	Amber 1000ml unpreserved	H1	7	7	2.1	Y	Absent		A2-RIM-8270(7)
L1844003-12F	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-12G	Amber 1000ml unpreserved	C1	7	7	2.4	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-13A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-13B	Plastic 950ml HNO3 preserved	B1	<2	<2	3.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)



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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-13C	Plastic 950ml HNO3 preserved	B1	<2	<2	3.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-13D	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-8270(7)
L1844003-13E	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-8270(7)
L1844003-13F	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-13G	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-14A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-14B	Plastic 950ml HNO3 preserved	B1	<2	<2	3.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-14C	Plastic 950ml HNO3 preserved	B1	<2	<2	3.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-14D	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-8270(7)
L1844003-14E	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-8270(7)
L1844003-14F	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-14G	Amber 1000ml unpreserved	B1	7	7	3.0	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-15A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-15B	Plastic 950ml HNO3 preserved	D1	<2	<2	4.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-15C	Plastic 950ml HNO3 preserved	D1	<2	<2	4.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-15D	Amber 1000ml unpreserved	F1	7	7	2.0	Y	Absent		A2-RIM-8270(7)



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

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Project Number: 60588790 TASK 6.0

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-15E	Amber 1000ml unpreserved	F1	7	7	2.0	Y	Absent		A2-RIM-8270(7)
L1844003-15F	Amber 1000ml unpreserved	F1	7	7	2.0	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-15G	Amber 1000ml unpreserved	F1	7	7	2.0	Y	Absent		A2-RIM-PCBCONG-8270(7)
L1844003-16A	Plastic 950ml unpreserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-16B	Plastic 950ml unpreserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-16C	Plastic 950ml unpreserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-16D	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16E	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16F	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16G	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16H	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16I	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-16J	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-16K	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1844003-16L	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1844003-16M	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1844003-16N	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1844003-16O	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7),A2-RIM-PEST-ELUT(7)
L1844003-16P	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-16Q	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-16R	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16R1	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16S	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16S1	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16T	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16T1	Amber 1000ml unpreserved	D1	7	7	4.0	Y	Absent		A2-RIM-8270(7)
L1844003-16U	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-16U1	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-17A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-17B	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-17C	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-17D	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-17E	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-17F	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-17G	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1844003**Project Number:** 60588790 TASK 6.0**Report Date:** 11/28/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1844003-18A	Plastic 950ml HNO3 preserved	I	7	7	2.8	Y	Absent		HEXCR-3500(1)
L1844003-18B	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-18C	Plastic 950ml HNO3 preserved	F1	<2	<2	2.0	Y	Absent		A2-PB-6020T(180),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-SE-HGAF-T(180),A2-AS-HGAF-T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-AG-6020T(180),A2-CU-6020T(180)
L1844003-18D	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-18E	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-8270(7)
L1844003-18F	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PEST-ELUT(7)
L1844003-18G	Amber 1000ml unpreserved	G1	7	7	3.2	Y	Absent		A2-RIM-PCBCONG-8270(7)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
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Lab Number: L1844003
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Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 6.0

Lab Number: L1844003
Report Date: 11/28/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 86 Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry. USEPA Office of Water, EPA Method 1632, Revision A, August 1998.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	Yes
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No – see narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	Yes
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	No – see narrative





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	





Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	No	Pentachlorophenol 27.3%	Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	No	L1844003-11: BZ198 on column 2 @ 184% L1844003-13: BZ198 on column 2 @ 291% L1844003-14: BZ198 on column 2 @ 360% L1844003-16: BZ198 on column 2 @ 2711%	In Data Package





			L1844003-17: BZ198 on column 2 @ 303%	
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* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No	CCV associated with Blank, LCS, LCSD: C12-BZ#8 @ 18%, C13-BZ#18 @ 18%, C13-BZ#28 @ 18%, C14-BZ#44 @ 17%, C14-BZ#66 @ 18%, C14-BZ#77 @ 19% CCV associated with all field samples: C12-BZ#8 @ 18%, C13-BZ#18 @ 18%, C14-BZ#49 @ 20%, C14-BZ#77 @ 17%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	NA		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	NA		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package





* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	N/A		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	No	WG1177006-3 MS Cd(0%), Cr(12%), Cu(0%), Pb(7%), Ni(0%), Ag(0%), Zn(22%) WG1180588-3/4 MS/MSD Hg(78%/78%)	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





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ESI Job No:

Serial_No:11281815:07

L 1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0 Fax: 0	email: kris.vannaerssen@aecom.com	ERR

Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
44003 - 01	Composite 3 Elutriate Blank - Rep 1	10/26/18	9:20	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
-02	Composite 3 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
-03	Composite 3 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
-01	Composite 3 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
-02	Composite 3 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
-03	Composite 3 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
-01	Composite 3 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
-02	Composite 3 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
-03	Composite 3 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
-01	Composite 3 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
-02	Composite 3 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
-03	Composite 3 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments:

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Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
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Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 5 Elutriate Blank - Rep 1	10/26/18	11:40	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
44003-04	Composite 5 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
-05	Composite 5 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
-06	Composite 5 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

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CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
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Protocol: CENAE												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 4 Elutriate Blank - Rep 1	10/24/18	9:20	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
44003-07	Composite 4 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
-08	Composite 4 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
-09	Composite 4 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

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Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

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Voice: 0 Fax: 0		email: kris.vannaerssen@aecom.com ERR

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 5-Elutriate - Rep 1	10/26/18	1525	ES1	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 5 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 5 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
44003-10	Composite 5 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
-11	Composite 5 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
-12	Composite 5 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments:

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COC Number: A1016866

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Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com

Protocol: CENAE ERR

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done at field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 4 Elutriate - Rep 1	10/26/18	13:10	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 4 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 4 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
44003-13	Composite 4 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
-14	Composite 4 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
-15	Composite 4 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments:

ERR

COC Number: A1016866

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:11281815:07

L1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com ERR

Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	Container No	Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
	Composite 3 Elutriate - Rep 1	10/26/18	11:15	ESI	C	6	1000	G	HNO3	Water	N	Total Metals
	Composite 3 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
	Composite 3 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
	Composite 3 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PCP
	Composite 3 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
	Composite 3 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
	Composite 3 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PEST/CGR
	Composite 3 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 3 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
44003-16	Composite 3 Elutriate - Rep 1					3	1000	P	4 C	Water	N	CR6
-17	Composite 3 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
-18	Composite 3 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25	Received By: <i>[Signature]</i>	Date: 10/26/18	Time: 17:25
Relinquished By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50	Received at Lab By: <i>[Signature]</i>	Date: 10/26/18	Time: 19:50

Comments:

ERR

COC Number: A1016866

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial No: 11281815:07

4844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0 Fax: 0		email: kris.vannaerssen@aecom.com ERR

Protocol: CENAE												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
14 003.04	Composite 5 Elutriate Blank - Rep 1	10/26/18	11:40	ESJ	C	2	1000	G	HNO3	Water	N	Total Metals
.05	Composite 5 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
.106	Composite 5 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
.04	Composite 5 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
.05	Composite 5 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
.06	Composite 5 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
.04	Composite 5 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
.05	Composite 5 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
.06	Composite 5 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 5 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 5 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 0930	Received By: <i>[Signature]</i>	Date: 10/29/18 Time: 945
Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 1145	Received at Lab By: <i>[Signature]</i>	Date: 10/29/18 Time: 1043

Comments:

ERR
Rel contact 10/29/18
COC Number: A1016866
AEC AECM 10/29/18 1415
Res AECM 10/29/18
Rec: K... 10/29/18 1415

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:11281815:07

L1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor	
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803	Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen	
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com	ERR

Protocol: GENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
<i>44003.07</i>	Composite 4 Elutriate Blank - Rep 1	<i>10/20/18</i>	<i>9:20</i>	<i>ESI</i>	<i>C</i>	2	1000	G	HNO3	Water	N	Total Metals
<i>.08</i>	Composite 4 Elutriate Blank - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
<i>.09</i>	Composite 4 Elutriate Blank - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
<i>.07</i>	Composite 4 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PCP
<i>.08</i>	Composite 4 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PCP
<i>.09</i>	Composite 4 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PCP
<i>.07</i>	Composite 4 Elutriate Blank - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
<i>.08</i>	Composite 4 Elutriate Blank - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
<i>.09</i>	Composite 4 Elutriate Blank - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate Blank - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 4 Elutriate Blank - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 4 Elutriate Blank - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: <i>10/29/18</i> Time: <i>0930</i>	Received By: <i>[Signature]</i>	Date: <i>10/29/18</i> Time: <i>945</i>
Relinquished By: <i>[Signature]</i>	Date: <i>10/29/18</i> Time: <i>1143</i>	Received at Lab By: <i>[Signature]</i>	Date: <i>10/29/18</i> Time: <i>1143</i>

Comments:

ERR

Rel. sent at 10/29/18 Rec. Acct 10/31/18
REL Acct 10/29/18 1415 Rec. Kim Bailey 10/29/18 1415

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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:11281815:07

L1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor	
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803	Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen	
Voice: 0	Fax: 0	email: kris.vannaerssen@aecom.com	ERR

Protocol: CENAE		Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container		Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:	
Lab Number (assigned by lab)	Your Field ID: (must agree with container)					No	Size (mL)					Type (P/G/T)
44003.10	Composite 5 Elutriate - Rep 1	10/26/18	1525	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
.11	Composite 5 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
.12	Composite 5 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
.10	Composite 5 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
.11	Composite 5 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
.12	Composite 5 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
.10	Composite 5 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
.11	Composite 5 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
.12	Composite 5 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 5 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 5 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 5 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 0930	Received By: <i>[Signature]</i>	Date: 10/29/18 Time: 9:10
Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 1143	Received at Lab By: <i>[Signature]</i>	Date: 10/29/18 Time: 1143

Comments:

ERR

REL *[Signature]* 10/29/18
COC Number: A1016866

REC *[Signature]* 10/29/18
REC: *[Signature]* 10/29/18 1415

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:11281815:07

L1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0 Fax: 0		email: kris.vannaerssen@aecom.com

ERR

Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Size (mL)	Type (P/G/R)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
44003, 13	Composite 4 Elutriate - Rep 1	10/26/18	1310	ESI	C	2	1000	G	HNO3	Water	N	Total Metals
14	Composite 4 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
15	Composite 4 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
13	Composite 4 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PCP
14	Composite 4 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
15	Composite 4 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
13	Composite 4 Elutriate - Rep 1					2	1000	G	4 C	Water	N	PEST/CGR
14	Composite 4 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
15	Composite 4 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 4 Elutriate - Rep 1					1	1000	P	4 C	Water	N	CR6
	Composite 4 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 4 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 0930	Received By: <i>[Signature]</i>	Date: 10/29/18 Time: 0905
Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 1143	Received at Lab By: <i>[Signature]</i>	Date: 10/29/18 Time: 1143

Comments:

ERR

Rel *[Signature]* 10/29/18 REC *[Signature]* 10/29/18
COC Number: A1016866
REC *[Signature]* 10/29/18 REC: *[Signature]* 10/29/18

Sample Delivery Group No:	October 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial No: 11281815:07

L1844003

CHAIN OF CUSTODY DOCUMENTATION

Client: AECOM	Contact: Kris Van Naerssen	Project Name: AECOM - New Haven Harbor
Report to: Kris Van Naerssen	Address: 500 Enterprise Drive Suite 1A	Project Number: P0803 Task: 0001
Invoice to: Kris Van Naerssen	Address: Rocky Hill, CT 06067	Project Manager: Kris Van Naerssen
Voice: 0 Fax: 0		email: kris.vannaerssen@aecom.com ERR

Protocol: CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (PIGT)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions
44003.16	Composite 3 Elutriate - Rep 1	10/26/18	16:15 15:10	ESI	C	6	1000	G	HNO3	Water	N	Total Metals
.17	Composite 3 Elutriate - Rep 2					2	1000	G	HNO3	Water	N	Total Metals
.18	Composite 3 Elutriate - Rep 3					2	1000	G	HNO3	Water	N	Total Metals
.16	Composite 3 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PCP
.17	Composite 3 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PCP
.18	Composite 3 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PCP
.16	Composite 3 Elutriate - Rep 1					6	1000	G	4 C	Water	N	PEST/CGR
.17	Composite 3 Elutriate - Rep 2					2	1000	G	4 C	Water	N	PEST/CGR
.18	Composite 3 Elutriate - Rep 3					2	1000	G	4 C	Water	N	PEST/CGR
	Composite 3 Elutriate - Rep 1					3	1000	P	4 C	Water	N	CR6
	Composite 3 Elutriate - Rep 2					1	1000	P	4 C	Water	N	CR6
	Composite 3 Elutriate - Rep 3					1	1000	P	4 C	Water	N	CR6

Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 0930	Received By: <i>[Signature]</i>	Date: 10/29/18 Time: 9:45
Relinquished By: <i>[Signature]</i>	Date: 10/29/18 Time: 11:43	Received at Lab By: <i>[Signature]</i>	Date: 10/29/18 Time: 11:43

Comments:

ERR
REL *[Signature]* 10/29/18
REL *[Signature]* 10/29/18
REL *[Signature]* 10/29/18 14:15
REL *[Signature]* 10/29/18 14:15

Sample Delivery Group No:	October 2018	Page	of
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Appendix C.2: Sediment Chemistry Lab Report

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

April 11, 2019

Sediment Chemistry Report - Revised Submittal



ANALYTICAL REPORT

Lab Number:	L1843305
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 5.0
Report Date:	04/05/19

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1843305-01	TB-2	SEDIMENT	NEW HAVEN, CT	10/22/18 16:50	10/24/18
L1843305-02	US-2 0.0-5.0	SEDIMENT	NEW HAVEN, CT	10/22/18 17:15	10/24/18
L1843305-03	US-2 5.0-6.0	SEDIMENT	NEW HAVEN, CT	10/22/18 15:17	10/24/18
L1843305-04	TB-1 0-5.2	SEDIMENT	NEW HAVEN, CT	10/23/18 10:25	10/24/18
L1843305-05	TB-1 5.2-6.0	SEDIMENT	NEW HAVEN, CT	10/23/18 10:30	10/24/18
L1843305-06	CAD-3 0-5.5	SEDIMENT	NEW HAVEN, CT	10/23/18 11:10	10/24/18
L1843305-07	US-1 0-5.5	SEDIMENT	NEW HAVEN, CT	10/23/18 12:24	10/24/18
L1843305-08	CAD-2 0.5.3	SEDIMENT	NEW HAVEN, CT	10/23/18 13:10	10/24/18
L1843305-09	CAD-2 5.3-10.8	SEDIMENT	NEW HAVEN, CT	10/23/18 14:20	10/24/18
L1843305-10	W1	SEDIMENT	NEW HAVEN, CT	10/23/18 12:10	10/24/18
L1843305-11	V1	SEDIMENT	NEW HAVEN, CT	10/23/18 11:31	10/24/18
L1843305-12	S1	SEDIMENT	NEW HAVEN, CT	10/23/18 12:25	10/24/18
L1843305-13	R1	SEDIMENT	NEW HAVEN, CT	10/23/18 12:39	10/24/18
L1843305-14	CAD-3 6.1-9.9	SEDIMENT	NEW HAVEN, CT	10/23/18 15:00	10/24/18
L1843305-15	CAD-1 0-4.0	SEDIMENT	NEW HAVEN, CT	10/23/18 16:34	10/24/18
L1843305-16	CAD-1 4.4-9.0	SEDIMENT	NEW HAVEN, CT	10/23/18 16:30	10/24/18
L1843305-17	DS-1 0-7.3	SEDIMENT	NEW HAVEN, CT	10/23/18 16:15	10/24/18
L1843305-18	DS-2 0-7.0	SEDIMENT	NEW HAVEN, CT	10/23/18 17:35	10/24/18

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Case Narrative (continued)

Report Reissue

This report replaces the report issued on November 19, 2018. The PCB data has been revised.

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L1843305: Samples were frozen upon receipt in order to arrest the holding time.

L1843305-02: The collection date and time on the chain of custody was 22-OCT-18 17:20; however, the collection date/time on the container label was 22-OCT-18 17:15. At the client's request, the collection date/time is reported as 22-OCT-18 17:15.

L1843305-03: The collection date and time on the chain of custody was 22-OCT-18 17:20; however, the collection date/time on the container label was 22-OCT-18 15:17. At the client's request, the collection date/time is reported as 22-OCT-18 15:17.

L1843305-05: The collection date and time on the chain of custody was 23-OCT-18 10:25; however, the collection date/time on the container label was 23-OCT-18 10:30. At the client's request, the collection date/time is reported as 23-OCT-18 10:30.

L1843305-06: The collection date and time on the chain of custody was 23-OCT-18 11:43; however, the collection date/time on the container label was 23-OCT-18 11:10. At the client's request, the collection date/time is reported as 23-OCT-18 11:10.

L1843305-07: The collection date and time on the chain of custody was 23-OCT-18 12:37; however, the collection date/time on the container label was 23-OCT-18 12:24. At the client's request, the collection date/time is reported as 23-OCT-18 12:24.

L1843305-08: The collection date and time on the chain of custody was 23-OCT-18 13:47; however, the collection date/time on the container label was 23-OCT-18 13:10. At the client's request, the collection date/time is reported as 23-OCT-18 13:10.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Case Narrative (continued)

L1843305-09: The collection date and time on the chain of custody was 23-OCT-18 14:15; however, the collection date/time on the container label was 23-OCT-18 14:20. At the client's request, the collection date/time is reported as 23-OCT-18 14:20.

L1843305-15: The collection date and time on the chain of custody was 23-OCT-18 15:58; however, the collection date/time on the container label was 23-OCT-18 16:34. At the client's request, the collection date/time is reported as 23-OCT-18 16:34

L1843305-17: The collection date and time on the chain of custody was 23-OCT-18 17:00; however, the collection date/time on the container label was 23-OCT-18 16:45. At the client's request, the collection date/time is reported as 23-OCT-18 16:15.

L1843305-18: The collection date and time on the chain of custody was 23-OCT-18 17:38; however, the collection date/time on the container label was 23-OCT-18 17:35. At the client's request, the collection date/time is reported as 23-OCT-18 17:35.

Semivolatile Organics

PCB Congeners for samples L1843305-01, -02, -04, -06, -07, -08, -10, -11, -12, -13, -15, -17 and -18 do not meet required detection limits due to moisture content of the samples.

PAHs for samples L1843305-01, -02, -04, -06, -07, -08, -10, -11, -12, -13, -15, -17, and -18 have elevated detection limits due to the dilution required by the sample matrix.

The WG1218700-4 Laboratory Duplicate RPDs for Cl5-BZ#101 (42%), Cl5-BZ#118 (46%), Cl6-BZ#138 (51%) and Cl6-BZ#153 (45%), performed on L1843305-07, are outside the acceptance criteria. The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

Pesticides

The WG1173137-7 MSD recoveries, performed on L1843305-07, are outside the acceptance criteria for endosulfan II (145%) and 4,4'-DDT (127%).

The SRM WG1173137-4 recovery for trans-Nonachlor (486%) is above the acceptance criteria.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19


Case Narrative (continued)

Total Metals

The WG1178831-3/-4 MS/MSD recovery, performed on L1843305-07, is outside the acceptance criteria for copper (70%/65%) and zinc (72%/72%). A post digestion spike was performed and was within acceptance criteria.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Elizabeth Porta

Title: Technical Director/Representative

Date: 04/05/19

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-01
 Client ID: TB-2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 16:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 17:38
 Analyst: GP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.26	0.632	1
CI3-BZ#18	ND		ug/kg	1.26	0.632	1
CI3-BZ#28	1.01	J	ug/kg	1.26	0.632	1
CI4-BZ#44	1.24	J	ug/kg	1.26	0.632	1
CI4-BZ#49	1.59		ug/kg	1.26	0.632	1
CI4-BZ#52	1.38		ug/kg	1.26	0.632	1
CI4-BZ#66	1.83		ug/kg	1.26	0.632	1
CI5-BZ#87	0.872	J	ug/kg	1.26	0.632	1
CI5-BZ#101	3.08		ug/kg	1.26	0.632	1
CI5-BZ#105	0.752	J	ug/kg	1.26	0.632	1
CI5-BZ#118	2.59		ug/kg	1.26	0.632	1
CI6-BZ#128	1.06	J	ug/kg	1.26	0.632	1
CI6-BZ#138	3.51		ug/kg	1.26	0.632	1
CI6-BZ#153	2.82		ug/kg	1.26	0.632	1
CI7-BZ#170	0.711	J	ug/kg	1.26	0.632	1
CI7-BZ#180	1.62		ug/kg	1.26	0.632	1
CI7-BZ#183	ND		ug/kg	1.26	0.632	1
CI7-BZ#184	ND		ug/kg	1.26	0.632	1
CI7-BZ#187	1.40		ug/kg	1.26	0.632	1
CI8-BZ#195	ND		ug/kg	1.26	0.632	1
CI9-BZ#206	0.847	J	ug/kg	1.26	0.632	1
CI10-BZ#209	ND		ug/kg	1.26	0.632	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	101		30-150
BZ 198	88		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-01 D
 Client ID: TB-2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 16:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 21:23
 Analyst: GP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	76.2		ug/kg	65.6	32.8	5
Acenaphthylene	34.0	J	ug/kg	65.6	32.8	5
Acenaphthene	ND		ug/kg	65.6	32.8	5
Fluorene	ND		ug/kg	65.6	32.8	5
Phenanthrene	188		ug/kg	65.6	32.8	5
Anthracene	51.5	J	ug/kg	65.6	32.8	5
Fluoranthene	564		ug/kg	65.6	32.8	5
Pyrene	516		ug/kg	65.6	32.8	5
Benz(a)anthracene	264		ug/kg	65.6	32.8	5
Chrysene	327		ug/kg	65.6	32.8	5
Benzo(b)fluoranthene	403		ug/kg	65.6	32.8	5
Benzo(k)fluoranthene	287		ug/kg	65.6	32.8	5
Benzo(a)pyrene	323		ug/kg	65.6	32.8	5
Indeno(1,2,3-cd)Pyrene	352		ug/kg	65.6	32.8	5
Dibenz(a,h)anthracene	65.6		ug/kg	65.6	32.8	5
Benzo(ghi)perylene	294		ug/kg	65.6	32.8	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	93		30-150
Pyrene-d10	103		30-150
Benzo(b)fluoranthene-d12	98		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-02
 Client ID: US-2 0.0-5.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 17:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 18:13
 Analyst: GP
 Percent Solids: 42%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	0.669	J	ug/kg	1.13	0.566	1
CI3-BZ#18	1.55		ug/kg	1.13	0.566	1
CI3-BZ#28	2.42		ug/kg	1.13	0.566	1
CI4-BZ#44	3.83		ug/kg	1.13	0.566	1
CI4-BZ#49	3.60		ug/kg	1.13	0.566	1
CI4-BZ#52	6.72		ug/kg	1.13	0.566	1
CI4-BZ#66	3.77		ug/kg	1.13	0.566	1
CI5-BZ#87	1.98		ug/kg	1.13	0.566	1
CI5-BZ#101	5.58		ug/kg	1.13	0.566	1
CI5-BZ#105	1.18		ug/kg	1.13	0.566	1
CI5-BZ#118	3.78		ug/kg	1.13	0.566	1
CI6-BZ#128	0.737	J	ug/kg	1.13	0.566	1
CI6-BZ#138	5.31		ug/kg	1.13	0.566	1
CI6-BZ#153	4.88		ug/kg	1.13	0.566	1
CI7-BZ#170	2.67		ug/kg	1.13	0.566	1
CI7-BZ#180	3.03		ug/kg	1.13	0.566	1
CI7-BZ#183	0.941	J	ug/kg	1.13	0.566	1
CI7-BZ#184	ND		ug/kg	1.13	0.566	1
CI7-BZ#187	2.17		ug/kg	1.13	0.566	1
CI8-BZ#195	ND		ug/kg	1.13	0.566	1
CI9-BZ#206	1.02	J	ug/kg	1.13	0.566	1
CI10-BZ#209	ND		ug/kg	1.13	0.566	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	85		30-150
BZ 198	70		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-02 D
 Client ID: US-2 0.0-5.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 17:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 21:56
 Analyst: GP
 Percent Solids: 42%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	190		ug/kg	57.1	28.5	5
Acenaphthylene	62.4		ug/kg	57.1	28.5	5
Acenaphthene	51.2	J	ug/kg	57.1	28.5	5
Fluorene	83.4		ug/kg	57.1	28.5	5
Phenanthrene	321		ug/kg	57.1	28.5	5
Anthracene	119		ug/kg	57.1	28.5	5
Fluoranthene	1060		ug/kg	57.1	28.5	5
Pyrene	914		ug/kg	57.1	28.5	5
Benz(a)anthracene	475		ug/kg	57.1	28.5	5
Chrysene	590		ug/kg	57.1	28.5	5
Benzo(b)fluoranthene	613		ug/kg	57.1	28.5	5
Benzo(k)fluoranthene	479		ug/kg	57.1	28.5	5
Benzo(a)pyrene	521		ug/kg	57.1	28.5	5
Indeno(1,2,3-cd)Pyrene	498		ug/kg	57.1	28.5	5
Dibenz(a,h)anthracene	100		ug/kg	57.1	28.5	5
Benzo(ghi)perylene	445		ug/kg	57.1	28.5	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	74		30-150
Pyrene-d10	87		30-150
Benzo(b)fluoranthene-d12	82		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-03
 Client ID: US-2 5.0-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 15:17
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 14:19
 Analyst: GP
 Percent Solids: 75%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	0.665	0.332	1
CI3-BZ#18	ND		ug/kg	0.665	0.332	1
CI3-BZ#28	ND		ug/kg	0.665	0.332	1
CI4-BZ#44	ND		ug/kg	0.665	0.332	1
CI4-BZ#49	ND		ug/kg	0.665	0.332	1
CI4-BZ#52	ND		ug/kg	0.665	0.332	1
CI4-BZ#66	ND		ug/kg	0.665	0.332	1
CI5-BZ#87	ND		ug/kg	0.665	0.332	1
CI5-BZ#101	ND		ug/kg	0.665	0.332	1
CI5-BZ#105	ND		ug/kg	0.665	0.332	1
CI5-BZ#118	ND		ug/kg	0.665	0.332	1
CI6-BZ#128	ND		ug/kg	0.665	0.332	1
CI6-BZ#138	ND		ug/kg	0.665	0.332	1
CI6-BZ#153	ND		ug/kg	0.665	0.332	1
CI7-BZ#170	ND		ug/kg	0.665	0.332	1
CI7-BZ#180	ND		ug/kg	0.665	0.332	1
CI7-BZ#183	ND		ug/kg	0.665	0.332	1
CI7-BZ#184	ND		ug/kg	0.665	0.332	1
CI7-BZ#187	ND		ug/kg	0.665	0.332	1
CI8-BZ#195	ND		ug/kg	0.665	0.332	1
CI9-BZ#206	ND		ug/kg	0.665	0.332	1
CI10-BZ#209	ND		ug/kg	0.665	0.332	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	87		30-150
BZ 198	78		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-03
 Client ID: US-2 5.0-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 15:17
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 16:37
 Analyst: GP
 Percent Solids: 75%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	12.0	5.99	1
Acenaphthylene	ND		ug/kg	12.0	5.99	1
Acenaphthene	ND		ug/kg	12.0	5.99	1
Fluorene	ND		ug/kg	12.0	5.99	1
Phenanthrene	ND		ug/kg	12.0	5.99	1
Anthracene	ND		ug/kg	12.0	5.99	1
Fluoranthene	ND		ug/kg	12.0	5.99	1
Pyrene	ND		ug/kg	12.0	5.99	1
Benz(a)anthracene	ND		ug/kg	12.0	5.99	1
Chrysene	ND		ug/kg	12.0	5.99	1
Benzo(b)fluoranthene	ND		ug/kg	12.0	5.99	1
Benzo(k)fluoranthene	ND		ug/kg	12.0	5.99	1
Benzo(a)pyrene	ND		ug/kg	12.0	5.99	1
Indeno(1,2,3-cd)Pyrene	6.13	J	ug/kg	12.0	5.99	1
Dibenz(a,h)anthracene	ND		ug/kg	12.0	5.99	1
Benzo(ghi)perylene	ND		ug/kg	12.0	5.99	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	67		30-150
Pyrene-d10	82		30-150
Benzo(b)fluoranthene-d12	84		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-04
 Client ID: TB-1 0-5.2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 18:47
 Analyst: GP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.33	0.665	1
CI3-BZ#18	ND		ug/kg	1.33	0.665	1
CI3-BZ#28	0.776	J	ug/kg	1.33	0.665	1
CI4-BZ#44	1.00	J	ug/kg	1.33	0.665	1
CI4-BZ#49	1.08	J	ug/kg	1.33	0.665	1
CI4-BZ#52	1.04	J	ug/kg	1.33	0.665	1
CI4-BZ#66	1.34		ug/kg	1.33	0.665	1
CI5-BZ#87	ND		ug/kg	1.33	0.665	1
CI5-BZ#101	2.40		ug/kg	1.33	0.665	1
CI5-BZ#105	ND		ug/kg	1.33	0.665	1
CI5-BZ#118	1.60		ug/kg	1.33	0.665	1
CI6-BZ#128	0.986	J	ug/kg	1.33	0.665	1
CI6-BZ#138	2.48		ug/kg	1.33	0.665	1
CI6-BZ#153	2.24		ug/kg	1.33	0.665	1
CI7-BZ#170	0.912	J	ug/kg	1.33	0.665	1
CI7-BZ#180	1.28	J	ug/kg	1.33	0.665	1
CI7-BZ#183	ND		ug/kg	1.33	0.665	1
CI7-BZ#184	ND		ug/kg	1.33	0.665	1
CI7-BZ#187	1.07	J	ug/kg	1.33	0.665	1
CI8-BZ#195	ND		ug/kg	1.33	0.665	1
CI9-BZ#206	ND		ug/kg	1.33	0.665	1
CI10-BZ#209	ND		ug/kg	1.33	0.665	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	86		30-150
BZ 198	76		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-04 D
 Client ID: TB-1 0-5.2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 22:30
 Analyst: GP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	62.4	J	ug/kg	66.2	33.1	5
Acenaphthylene	ND		ug/kg	66.2	33.1	5
Acenaphthene	ND		ug/kg	66.2	33.1	5
Fluorene	ND		ug/kg	66.2	33.1	5
Phenanthrene	159		ug/kg	66.2	33.1	5
Anthracene	45.5	J	ug/kg	66.2	33.1	5
Fluoranthene	493		ug/kg	66.2	33.1	5
Pyrene	448		ug/kg	66.2	33.1	5
Benzo(a)anthracene	250		ug/kg	66.2	33.1	5
Chrysene	324		ug/kg	66.2	33.1	5
Benzo(b)fluoranthene	362		ug/kg	66.2	33.1	5
Benzo(k)fluoranthene	276		ug/kg	66.2	33.1	5
Benzo(a)pyrene	303		ug/kg	66.2	33.1	5
Indeno(1,2,3-cd)Pyrene	331		ug/kg	66.2	33.1	5
Dibenz(a,h)anthracene	62.1	J	ug/kg	66.2	33.1	5
Benzo(ghi)perylene	271		ug/kg	66.2	33.1	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-150
Pyrene-d10	95		30-150
Benzo(b)fluoranthene-d12	91		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-05
 Client ID: TB-1 5.2-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 14:54
 Analyst: GP
 Percent Solids: 73%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	0.677	0.338	1
CI3-BZ#18	ND		ug/kg	0.677	0.338	1
CI3-BZ#28	ND		ug/kg	0.677	0.338	1
CI4-BZ#44	ND		ug/kg	0.677	0.338	1
CI4-BZ#49	ND		ug/kg	0.677	0.338	1
CI4-BZ#52	ND		ug/kg	0.677	0.338	1
CI4-BZ#66	ND		ug/kg	0.677	0.338	1
CI5-BZ#87	ND		ug/kg	0.677	0.338	1
CI5-BZ#101	0.370	J	ug/kg	0.677	0.338	1
CI5-BZ#105	ND		ug/kg	0.677	0.338	1
CI5-BZ#118	ND		ug/kg	0.677	0.338	1
CI6-BZ#128	ND		ug/kg	0.677	0.338	1
CI6-BZ#138	0.435	J	ug/kg	0.677	0.338	1
CI6-BZ#153	0.354	J	ug/kg	0.677	0.338	1
CI7-BZ#170	ND		ug/kg	0.677	0.338	1
CI7-BZ#180	ND		ug/kg	0.677	0.338	1
CI7-BZ#183	ND		ug/kg	0.677	0.338	1
CI7-BZ#184	ND		ug/kg	0.677	0.338	1
CI7-BZ#187	ND		ug/kg	0.677	0.338	1
CI8-BZ#195	ND		ug/kg	0.677	0.338	1
CI9-BZ#206	ND		ug/kg	0.677	0.338	1
CI10-BZ#209	ND		ug/kg	0.677	0.338	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	84		30-150
BZ 198	77		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-05
 Client ID: TB-1 5.2-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 17:11
 Analyst: GP
 Percent Solids: 73%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	13.7		ug/kg	13.1	6.54	1
Acenaphthylene	ND		ug/kg	13.1	6.54	1
Acenaphthene	ND		ug/kg	13.1	6.54	1
Fluorene	ND		ug/kg	13.1	6.54	1
Phenanthrene	8.60	J	ug/kg	13.1	6.54	1
Anthracene	ND		ug/kg	13.1	6.54	1
Fluoranthene	17.2		ug/kg	13.1	6.54	1
Pyrene	24.5		ug/kg	13.1	6.54	1
Benz(a)anthracene	9.75	J	ug/kg	13.1	6.54	1
Chrysene	11.1	J	ug/kg	13.1	6.54	1
Benzo(b)fluoranthene	14.5		ug/kg	13.1	6.54	1
Benzo(k)fluoranthene	11.1	J	ug/kg	13.1	6.54	1
Benzo(a)pyrene	12.1	J	ug/kg	13.1	6.54	1
Indeno(1,2,3-cd)Pyrene	16.7		ug/kg	13.1	6.54	1
Dibenz(a,h)anthracene	ND		ug/kg	13.1	6.54	1
Benzo(ghi)perylene	10.7	J	ug/kg	13.1	6.54	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	67		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	84		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-06
 Client ID: CAD-3 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 19:21
 Analyst: GP
 Percent Solids: 46%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.05	0.526	1
CI3-BZ#18	ND		ug/kg	1.05	0.526	1
CI3-BZ#28	ND		ug/kg	1.05	0.526	1
CI4-BZ#44	0.636	J	ug/kg	1.05	0.526	1
CI4-BZ#49	0.630	J	ug/kg	1.05	0.526	1
CI4-BZ#52	0.632	J	ug/kg	1.05	0.526	1
CI4-BZ#66	0.533	J	ug/kg	1.05	0.526	1
CI5-BZ#87	0.538	J	ug/kg	1.05	0.526	1
CI5-BZ#101	1.09		ug/kg	1.05	0.526	1
CI5-BZ#105	ND		ug/kg	1.05	0.526	1
CI5-BZ#118	1.06		ug/kg	1.05	0.526	1
CI6-BZ#128	0.577	J	ug/kg	1.05	0.526	1
CI6-BZ#138	1.43		ug/kg	1.05	0.526	1
CI6-BZ#153	1.16		ug/kg	1.05	0.526	1
CI7-BZ#170	ND		ug/kg	1.05	0.526	1
CI7-BZ#180	0.793	J	ug/kg	1.05	0.526	1
CI7-BZ#183	ND		ug/kg	1.05	0.526	1
CI7-BZ#184	ND		ug/kg	1.05	0.526	1
CI7-BZ#187	0.752	J	ug/kg	1.05	0.526	1
CI8-BZ#195	ND		ug/kg	1.05	0.526	1
CI9-BZ#206	0.602	J	ug/kg	1.05	0.526	1
CI10-BZ#209	ND		ug/kg	1.05	0.526	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	113		30-150
BZ 198	97		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-06 D
 Client ID: CAD-3 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 23:04
 Analyst: GP
 Percent Solids: 46%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	97.0		ug/kg	52.4	26.2	5
Acenaphthylene	39.7	J	ug/kg	52.4	26.2	5
Acenaphthene	ND		ug/kg	52.4	26.2	5
Fluorene	42.7	J	ug/kg	52.4	26.2	5
Phenanthrene	326		ug/kg	52.4	26.2	5
Anthracene	113		ug/kg	52.4	26.2	5
Fluoranthene	848		ug/kg	52.4	26.2	5
Pyrene	1050		ug/kg	52.4	26.2	5
Benz(a)anthracene	449		ug/kg	52.4	26.2	5
Chrysene	476		ug/kg	52.4	26.2	5
Benzo(b)fluoranthene	484		ug/kg	52.4	26.2	5
Benzo(k)fluoranthene	380		ug/kg	52.4	26.2	5
Benzo(a)pyrene	557		ug/kg	52.4	26.2	5
Indeno(1,2,3-cd)Pyrene	461		ug/kg	52.4	26.2	5
Dibenz(a,h)anthracene	91.8		ug/kg	52.4	26.2	5
Benzo(ghi)perylene	445		ug/kg	52.4	26.2	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	74		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	86		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-07
 Client ID: US-1 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:24
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 19:55
 Analyst: GP
 Percent Solids: 36%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.36	0.681	1
CI3-BZ#18	1.44		ug/kg	1.36	0.681	1
CI3-BZ#28	ND		ug/kg	1.36	0.681	1
CI4-BZ#44	0.779	J	ug/kg	1.36	0.681	1
CI4-BZ#49	0.802	J	ug/kg	1.36	0.681	1
CI4-BZ#52	1.25	J	ug/kg	1.36	0.681	1
CI4-BZ#66	0.801	J	ug/kg	1.36	0.681	1
CI5-BZ#87	1.43		ug/kg	1.36	0.681	1
CI5-BZ#101	2.66		ug/kg	1.36	0.681	1
CI5-BZ#105	0.918	J	ug/kg	1.36	0.681	1
CI5-BZ#118	2.37		ug/kg	1.36	0.681	1
CI6-BZ#128	0.963	J	ug/kg	1.36	0.681	1
CI6-BZ#138	3.38		ug/kg	1.36	0.681	1
CI6-BZ#153	2.48		ug/kg	1.36	0.681	1
CI7-BZ#170	ND		ug/kg	1.36	0.681	1
CI7-BZ#180	1.54		ug/kg	1.36	0.681	1
CI7-BZ#183	ND		ug/kg	1.36	0.681	1
CI7-BZ#184	ND		ug/kg	1.36	0.681	1
CI7-BZ#187	0.922	J	ug/kg	1.36	0.681	1
CI8-BZ#195	ND		ug/kg	1.36	0.681	1
CI9-BZ#206	ND		ug/kg	1.36	0.681	1
CI10-BZ#209	ND		ug/kg	1.36	0.681	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	105		30-150
BZ 198	86		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-07 D
 Client ID: US-1 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:24
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 23:37
 Analyst: GP
 Percent Solids: 36%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	75.2		ug/kg	63.1	31.5	5
Acenaphthylene	52.7	J	ug/kg	63.1	31.5	5
Acenaphthene	51.4	J	ug/kg	63.1	31.5	5
Fluorene	55.9	J	ug/kg	63.1	31.5	5
Phenanthrene	323		ug/kg	63.1	31.5	5
Anthracene	104		ug/kg	63.1	31.5	5
Fluoranthene	1110		ug/kg	63.1	31.5	5
Pyrene	954		ug/kg	63.1	31.5	5
Benz(a)anthracene	511		ug/kg	63.1	31.5	5
Chrysene	624		ug/kg	63.1	31.5	5
Benzo(b)fluoranthene	595		ug/kg	63.1	31.5	5
Benzo(k)fluoranthene	488		ug/kg	63.1	31.5	5
Benzo(a)pyrene	522		ug/kg	63.1	31.5	5
Indeno(1,2,3-cd)Pyrene	520		ug/kg	63.1	31.5	5
Dibenz(a,h)anthracene	89.4		ug/kg	63.1	31.5	5
Benzo(ghi)perylene	439		ug/kg	63.1	31.5	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	97		30-150
Benzo(b)fluoranthene-d12	92		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-08
 Client ID: CAD-2 0.5.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 22:09
 Analyst: GP
 Percent Solids: 44%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.12	0.563	1
CI3-BZ#18	ND		ug/kg	1.12	0.563	1
CI3-BZ#28	ND		ug/kg	1.12	0.563	1
CI4-BZ#44	0.594	J	ug/kg	1.12	0.563	1
CI4-BZ#49	0.595	J	ug/kg	1.12	0.563	1
CI4-BZ#52	1.22		ug/kg	1.12	0.563	1
CI4-BZ#66	0.639	J	ug/kg	1.12	0.563	1
CI5-BZ#87	1.06	J	ug/kg	1.12	0.563	1
CI5-BZ#101	2.26		ug/kg	1.12	0.563	1
CI5-BZ#105	0.882	J	ug/kg	1.12	0.563	1
CI5-BZ#118	1.81		ug/kg	1.12	0.563	1
CI6-BZ#128	0.567	J	ug/kg	1.12	0.563	1
CI6-BZ#138	3.15		ug/kg	1.12	0.563	1
CI6-BZ#153	2.24		ug/kg	1.12	0.563	1
CI7-BZ#170	0.584	J	ug/kg	1.12	0.563	1
CI7-BZ#180	1.32		ug/kg	1.12	0.563	1
CI7-BZ#183	ND		ug/kg	1.12	0.563	1
CI7-BZ#184	ND		ug/kg	1.12	0.563	1
CI7-BZ#187	0.890	J	ug/kg	1.12	0.563	1
CI8-BZ#195	ND		ug/kg	1.12	0.563	1
CI9-BZ#206	ND		ug/kg	1.12	0.563	1
CI10-BZ#209	ND		ug/kg	1.12	0.563	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	120		30-150
BZ 198	96		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-08 D
 Client ID: CAD-2 0.5.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 01:53
 Analyst: GP
 Percent Solids: 44%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	41.2	J	ug/kg	54.0	27.0	5
Acenaphthylene	ND		ug/kg	54.0	27.0	5
Acenaphthene	ND		ug/kg	54.0	27.0	5
Fluorene	ND		ug/kg	54.0	27.0	5
Phenanthrene	134		ug/kg	54.0	27.0	5
Anthracene	49.3	J	ug/kg	54.0	27.0	5
Fluoranthene	348		ug/kg	54.0	27.0	5
Pyrene	431		ug/kg	54.0	27.0	5
Benz(a)anthracene	196		ug/kg	54.0	27.0	5
Chrysene	209		ug/kg	54.0	27.0	5
Benzo(b)fluoranthene	200		ug/kg	54.0	27.0	5
Benzo(k)fluoranthene	180		ug/kg	54.0	27.0	5
Benzo(a)pyrene	228		ug/kg	54.0	27.0	5
Indeno(1,2,3-cd)Pyrene	235		ug/kg	54.0	27.0	5
Dibenz(a,h)anthracene	40.8	J	ug/kg	54.0	27.0	5
Benzo(ghi)perylene	179		ug/kg	54.0	27.0	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-150
Pyrene-d10	86		30-150
Benzo(b)fluoranthene-d12	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-09
 Client ID: CAD-2 5.3-10.8
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 14:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 22:43
 Analyst: GP
 Percent Solids: 50%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	0.966	0.483	1
CI3-BZ#18	ND		ug/kg	0.966	0.483	1
CI3-BZ#28	ND		ug/kg	0.966	0.483	1
CI4-BZ#44	ND		ug/kg	0.966	0.483	1
CI4-BZ#49	ND		ug/kg	0.966	0.483	1
CI4-BZ#52	ND		ug/kg	0.966	0.483	1
CI4-BZ#66	ND		ug/kg	0.966	0.483	1
CI5-BZ#87	ND		ug/kg	0.966	0.483	1
CI5-BZ#101	ND		ug/kg	0.966	0.483	1
CI5-BZ#105	ND		ug/kg	0.966	0.483	1
CI5-BZ#118	ND		ug/kg	0.966	0.483	1
CI6-BZ#128	ND		ug/kg	0.966	0.483	1
CI6-BZ#138	ND		ug/kg	0.966	0.483	1
CI6-BZ#153	ND		ug/kg	0.966	0.483	1
CI7-BZ#170	ND		ug/kg	0.966	0.483	1
CI7-BZ#180	ND		ug/kg	0.966	0.483	1
CI7-BZ#183	ND		ug/kg	0.966	0.483	1
CI7-BZ#184	ND		ug/kg	0.966	0.483	1
CI7-BZ#187	ND		ug/kg	0.966	0.483	1
CI8-BZ#195	ND		ug/kg	0.966	0.483	1
CI9-BZ#206	ND		ug/kg	0.966	0.483	1
CI10-BZ#209	ND		ug/kg	0.966	0.483	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	91		30-150
BZ 198	72		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-09
 Client ID: CAD-2 5.3-10.8
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 14:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 19:08
 Analyst: GP
 Percent Solids: 50%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.13	4.56	1
Acenaphthylene	ND		ug/kg	9.13	4.56	1
Acenaphthene	ND		ug/kg	9.13	4.56	1
Fluorene	ND		ug/kg	9.13	4.56	1
Phenanthrene	ND		ug/kg	9.13	4.56	1
Anthracene	ND		ug/kg	9.13	4.56	1
Fluoranthene	ND		ug/kg	9.13	4.56	1
Pyrene	ND		ug/kg	9.13	4.56	1
Benzo(a)anthracene	ND		ug/kg	9.13	4.56	1
Chrysene	ND		ug/kg	9.13	4.56	1
Benzo(b)fluoranthene	ND		ug/kg	9.13	4.56	1
Benzo(k)fluoranthene	ND		ug/kg	9.13	4.56	1
Benzo(a)pyrene	ND		ug/kg	9.13	4.56	1
Indeno(1,2,3-cd)Pyrene	4.56	J	ug/kg	9.13	4.56	1
Dibenz(a,h)anthracene	ND		ug/kg	9.13	4.56	1
Benzo(ghi)perylene	ND		ug/kg	9.13	4.56	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	77		30-150
Pyrene-d10	97		30-150
Benzo(b)fluoranthene-d12	95		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-10
 Client ID: W1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 23:17
 Analyst: GP
 Percent Solids: 39%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	1.59		ug/kg	1.26	0.631	1
CI3-BZ#18	3.16		ug/kg	1.26	0.631	1
CI3-BZ#28	2.64		ug/kg	1.26	0.631	1
CI4-BZ#44	6.54		ug/kg	1.26	0.631	1
CI4-BZ#49	7.42		ug/kg	1.26	0.631	1
CI4-BZ#52	9.76		ug/kg	1.26	0.631	1
CI4-BZ#66	5.70		ug/kg	1.26	0.631	1
CI5-BZ#87	3.14		ug/kg	1.26	0.631	1
CI5-BZ#101	10.6		ug/kg	1.26	0.631	1
CI5-BZ#105	3.14		ug/kg	1.26	0.631	1
CI5-BZ#118	9.02		ug/kg	1.26	0.631	1
CI6-BZ#128	2.01		ug/kg	1.26	0.631	1
CI6-BZ#138	12.8		ug/kg	1.26	0.631	1
CI6-BZ#153	10.4		ug/kg	1.26	0.631	1
CI7-BZ#170	2.84		ug/kg	1.26	0.631	1
CI7-BZ#180	5.24		ug/kg	1.26	0.631	1
CI7-BZ#183	1.66		ug/kg	1.26	0.631	1
CI7-BZ#184	1.26		ug/kg	1.26	0.631	1
CI7-BZ#187	5.56		ug/kg	1.26	0.631	1
CI8-BZ#195	0.692	J	ug/kg	1.26	0.631	1
CI9-BZ#206	1.66		ug/kg	1.26	0.631	1
CI10-BZ#209	0.848	J	ug/kg	1.26	0.631	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	115		30-150
BZ 198	97		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-10 D
 Client ID: W1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 02:26
 Analyst: GP
 Percent Solids: 39%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	152		ug/kg	59.5	29.8	5
Acenaphthylene	68.2		ug/kg	59.5	29.8	5
Acenaphthene	67.0		ug/kg	59.5	29.8	5
Fluorene	92.6		ug/kg	59.5	29.8	5
Phenanthrene	417		ug/kg	59.5	29.8	5
Anthracene	146		ug/kg	59.5	29.8	5
Fluoranthene	1250		ug/kg	59.5	29.8	5
Pyrene	1070		ug/kg	59.5	29.8	5
Benz(a)anthracene	530		ug/kg	59.5	29.8	5
Chrysene	673		ug/kg	59.5	29.8	5
Benzo(b)fluoranthene	640		ug/kg	59.5	29.8	5
Benzo(k)fluoranthene	570		ug/kg	59.5	29.8	5
Benzo(a)pyrene	583		ug/kg	59.5	29.8	5
Indeno(1,2,3-cd)Pyrene	547		ug/kg	59.5	29.8	5
Dibenz(a,h)anthracene	116		ug/kg	59.5	29.8	5
Benzo(ghi)perylene	515		ug/kg	59.5	29.8	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	72		30-150
Pyrene-d10	94		30-150
Benzo(b)fluoranthene-d12	88		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-11
 Client ID: V1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:31
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 23:50
 Analyst: GP
 Percent Solids: 32%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.54	0.770	1
CI3-BZ#18	0.797	J	ug/kg	1.54	0.770	1
CI3-BZ#28	0.937	J	ug/kg	1.54	0.770	1
CI4-BZ#44	0.899	J	ug/kg	1.54	0.770	1
CI4-BZ#49	1.18	J	ug/kg	1.54	0.770	1
CI4-BZ#52	1.37	J	ug/kg	1.54	0.770	1
CI4-BZ#66	1.80		ug/kg	1.54	0.770	1
CI5-BZ#87	0.996	J	ug/kg	1.54	0.770	1
CI5-BZ#101	2.51		ug/kg	1.54	0.770	1
CI5-BZ#105	ND		ug/kg	1.54	0.770	1
CI5-BZ#118	2.18		ug/kg	1.54	0.770	1
CI6-BZ#128	0.913	J	ug/kg	1.54	0.770	1
CI6-BZ#138	3.37		ug/kg	1.54	0.770	1
CI6-BZ#153	2.84		ug/kg	1.54	0.770	1
CI7-BZ#170	1.02	J	ug/kg	1.54	0.770	1
CI7-BZ#180	1.66		ug/kg	1.54	0.770	1
CI7-BZ#183	ND		ug/kg	1.54	0.770	1
CI7-BZ#184	ND		ug/kg	1.54	0.770	1
CI7-BZ#187	1.52	J	ug/kg	1.54	0.770	1
CI8-BZ#195	ND		ug/kg	1.54	0.770	1
CI9-BZ#206	1.15	J	ug/kg	1.54	0.770	1
CI10-BZ#209	ND		ug/kg	1.54	0.770	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	121		30-150
BZ 198	96		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-11 D
 Client ID: V1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:31
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 03:00
 Analyst: GP
 Percent Solids: 32%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	37.5	J	ug/kg	74.7	37.4	5
Acenaphthylene	ND		ug/kg	74.7	37.4	5
Acenaphthene	ND		ug/kg	74.7	37.4	5
Fluorene	ND		ug/kg	74.7	37.4	5
Phenanthrene	161		ug/kg	74.7	37.4	5
Anthracene	46.5	J	ug/kg	74.7	37.4	5
Fluoranthene	505		ug/kg	74.7	37.4	5
Pyrene	466		ug/kg	74.7	37.4	5
Benz(a)anthracene	229		ug/kg	74.7	37.4	5
Chrysene	338		ug/kg	74.7	37.4	5
Benzo(b)fluoranthene	329		ug/kg	74.7	37.4	5
Benzo(k)fluoranthene	292		ug/kg	74.7	37.4	5
Benzo(a)pyrene	282		ug/kg	74.7	37.4	5
Indeno(1,2,3-cd)Pyrene	309		ug/kg	74.7	37.4	5
Dibenz(a,h)anthracene	51.5	J	ug/kg	74.7	37.4	5
Benzo(ghi)perylene	258		ug/kg	74.7	37.4	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	85		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-12
 Client ID: S1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 00:24
 Analyst: GP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	0.689	J	ug/kg	1.16	0.583	1
CI3-BZ#18	2.38		ug/kg	1.16	0.583	1
CI3-BZ#28	1.49		ug/kg	1.16	0.583	1
CI4-BZ#44	4.83		ug/kg	1.16	0.583	1
CI4-BZ#49	4.43		ug/kg	1.16	0.583	1
CI4-BZ#52	7.00		ug/kg	1.16	0.583	1
CI4-BZ#66	2.96		ug/kg	1.16	0.583	1
CI5-BZ#87	1.56		ug/kg	1.16	0.583	1
CI5-BZ#101	6.01		ug/kg	1.16	0.583	1
CI5-BZ#105	ND		ug/kg	1.16	0.583	1
CI5-BZ#118	3.82		ug/kg	1.16	0.583	1
CI6-BZ#128	1.66		ug/kg	1.16	0.583	1
CI6-BZ#138	6.11		ug/kg	1.16	0.583	1
CI6-BZ#153	5.26		ug/kg	1.16	0.583	1
CI7-BZ#170	1.89		ug/kg	1.16	0.583	1
CI7-BZ#180	2.52		ug/kg	1.16	0.583	1
CI7-BZ#183	0.766	J	ug/kg	1.16	0.583	1
CI7-BZ#184	ND		ug/kg	1.16	0.583	1
CI7-BZ#187	2.43		ug/kg	1.16	0.583	1
CI8-BZ#195	ND		ug/kg	1.16	0.583	1
CI9-BZ#206	0.922	J	ug/kg	1.16	0.583	1
CI10-BZ#209	ND		ug/kg	1.16	0.583	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	81		30-150
BZ 198	66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-12 D
 Client ID: S1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 03:34
 Analyst: GP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	122		ug/kg	59.7	29.8	5
Acenaphthylene	35.4	J	ug/kg	59.7	29.8	5
Acenaphthene	46.2	J	ug/kg	59.7	29.8	5
Fluorene	42.3	J	ug/kg	59.7	29.8	5
Phenanthrene	176		ug/kg	59.7	29.8	5
Anthracene	105		ug/kg	59.7	29.8	5
Fluoranthene	762		ug/kg	59.7	29.8	5
Pyrene	678		ug/kg	59.7	29.8	5
Benz(a)anthracene	327		ug/kg	59.7	29.8	5
Chrysene	382		ug/kg	59.7	29.8	5
Benzo(b)fluoranthene	370		ug/kg	59.7	29.8	5
Benzo(k)fluoranthene	368		ug/kg	59.7	29.8	5
Benzo(a)pyrene	356		ug/kg	59.7	29.8	5
Indeno(1,2,3-cd)Pyrene	360		ug/kg	59.7	29.8	5
Dibenz(a,h)anthracene	62.6		ug/kg	59.7	29.8	5
Benzo(ghi)perylene	306		ug/kg	59.7	29.8	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	65		30-150
Pyrene-d10	83		30-150
Benzo(b)fluoranthene-d12	79		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-13
 Client ID: R1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:39
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 00:58
 Analyst: GP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	0.635	J	ug/kg	1.20	0.598	1
CI3-BZ#18	1.25		ug/kg	1.20	0.598	1
CI3-BZ#28	1.03	J	ug/kg	1.20	0.598	1
CI4-BZ#44	2.75		ug/kg	1.20	0.598	1
CI4-BZ#49	2.27		ug/kg	1.20	0.598	1
CI4-BZ#52	2.77		ug/kg	1.20	0.598	1
CI4-BZ#66	1.87		ug/kg	1.20	0.598	1
CI5-BZ#87	0.976	J	ug/kg	1.20	0.598	1
CI5-BZ#101	3.30		ug/kg	1.20	0.598	1
CI5-BZ#105	ND		ug/kg	1.20	0.598	1
CI5-BZ#118	2.11		ug/kg	1.20	0.598	1
CI6-BZ#128	0.984	J	ug/kg	1.20	0.598	1
CI6-BZ#138	3.53		ug/kg	1.20	0.598	1
CI6-BZ#153	3.39		ug/kg	1.20	0.598	1
CI7-BZ#170	1.42		ug/kg	1.20	0.598	1
CI7-BZ#180	2.12		ug/kg	1.20	0.598	1
CI7-BZ#183	0.683	J	ug/kg	1.20	0.598	1
CI7-BZ#184	ND		ug/kg	1.20	0.598	1
CI7-BZ#187	1.76		ug/kg	1.20	0.598	1
CI8-BZ#195	ND		ug/kg	1.20	0.598	1
CI9-BZ#206	0.995	J	ug/kg	1.20	0.598	1
CI10-BZ#209	0.620	J	ug/kg	1.20	0.598	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	97		30-150
BZ 198	80		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-13 D
 Client ID: R1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:39
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 04:08
 Analyst: GP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	90.0		ug/kg	58.5	29.2	5
Acenaphthylene	51.4	J	ug/kg	58.5	29.2	5
Acenaphthene	40.0	J	ug/kg	58.5	29.2	5
Fluorene	53.8	J	ug/kg	58.5	29.2	5
Phenanthrene	290		ug/kg	58.5	29.2	5
Anthracene	95.4		ug/kg	58.5	29.2	5
Fluoranthene	811		ug/kg	58.5	29.2	5
Pyrene	710		ug/kg	58.5	29.2	5
Benz(a)anthracene	358		ug/kg	58.5	29.2	5
Chrysene	435		ug/kg	58.5	29.2	5
Benzo(b)fluoranthene	448		ug/kg	58.5	29.2	5
Benzo(k)fluoranthene	425		ug/kg	58.5	29.2	5
Benzo(a)pyrene	420		ug/kg	58.5	29.2	5
Indeno(1,2,3-cd)Pyrene	421		ug/kg	58.5	29.2	5
Dibenz(a,h)anthracene	75.4		ug/kg	58.5	29.2	5
Benzo(ghi)perylene	369		ug/kg	58.5	29.2	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	74		30-150
Pyrene-d10	84		30-150
Benzo(b)fluoranthene-d12	81		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-14
 Client ID: CAD-3 6.1-9.9
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 15:00
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/25/19 15:28
 Analyst: GP
 Percent Solids: 55%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	0.883	0.442	1
CI3-BZ#18	ND		ug/kg	0.883	0.442	1
CI3-BZ#28	ND		ug/kg	0.883	0.442	1
CI4-BZ#44	ND		ug/kg	0.883	0.442	1
CI4-BZ#49	ND		ug/kg	0.883	0.442	1
CI4-BZ#52	ND		ug/kg	0.883	0.442	1
CI4-BZ#66	ND		ug/kg	0.883	0.442	1
CI5-BZ#87	ND		ug/kg	0.883	0.442	1
CI5-BZ#101	ND		ug/kg	0.883	0.442	1
CI5-BZ#105	ND		ug/kg	0.883	0.442	1
CI5-BZ#118	ND		ug/kg	0.883	0.442	1
CI6-BZ#128	ND		ug/kg	0.883	0.442	1
CI6-BZ#138	ND		ug/kg	0.883	0.442	1
CI6-BZ#153	ND		ug/kg	0.883	0.442	1
CI7-BZ#170	ND		ug/kg	0.883	0.442	1
CI7-BZ#180	ND		ug/kg	0.883	0.442	1
CI7-BZ#183	ND		ug/kg	0.883	0.442	1
CI7-BZ#184	ND		ug/kg	0.883	0.442	1
CI7-BZ#187	ND		ug/kg	0.883	0.442	1
CI8-BZ#195	ND		ug/kg	0.883	0.442	1
CI9-BZ#206	ND		ug/kg	0.883	0.442	1
CI10-BZ#209	ND		ug/kg	0.883	0.442	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	59		30-150
BZ 198	54		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-14
 Client ID: CAD-3 6.1-9.9
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 15:00
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 19:42
 Analyst: GP
 Percent Solids: 55%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.43	4.21	1
Acenaphthylene	ND		ug/kg	8.43	4.21	1
Acenaphthene	ND		ug/kg	8.43	4.21	1
Fluorene	ND		ug/kg	8.43	4.21	1
Phenanthrene	4.62	J	ug/kg	8.43	4.21	1
Anthracene	ND		ug/kg	8.43	4.21	1
Fluoranthene	11.5		ug/kg	8.43	4.21	1
Pyrene	9.62		ug/kg	8.43	4.21	1
Benz(a)anthracene	5.46	J	ug/kg	8.43	4.21	1
Chrysene	4.38	J	ug/kg	8.43	4.21	1
Benzo(b)fluoranthene	5.25	J	ug/kg	8.43	4.21	1
Benzo(k)fluoranthene	ND		ug/kg	8.43	4.21	1
Benzo(a)pyrene	4.33	J	ug/kg	8.43	4.21	1
Indeno(1,2,3-cd)Pyrene	7.57	J	ug/kg	8.43	4.21	1
Dibenz(a,h)anthracene	ND		ug/kg	8.43	4.21	1
Benzo(ghi)perylene	ND		ug/kg	8.43	4.21	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	68		30-150
Pyrene-d10	87		30-150
Benzo(b)fluoranthene-d12	87		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-15
 Client ID: CAD-1 0-4.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:34
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 01:31
 Analyst: GP
 Percent Solids: 43%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.14	0.572	1
CI3-BZ#18	ND		ug/kg	1.14	0.572	1
CI3-BZ#28	ND		ug/kg	1.14	0.572	1
CI4-BZ#44	0.803	J	ug/kg	1.14	0.572	1
CI4-BZ#49	0.731	J	ug/kg	1.14	0.572	1
CI4-BZ#52	0.739	J	ug/kg	1.14	0.572	1
CI4-BZ#66	0.671	J	ug/kg	1.14	0.572	1
CI5-BZ#87	ND		ug/kg	1.14	0.572	1
CI5-BZ#101	1.27		ug/kg	1.14	0.572	1
CI5-BZ#105	ND		ug/kg	1.14	0.572	1
CI5-BZ#118	1.01	J	ug/kg	1.14	0.572	1
CI6-BZ#128	ND		ug/kg	1.14	0.572	1
CI6-BZ#138	1.53		ug/kg	1.14	0.572	1
CI6-BZ#153	1.37		ug/kg	1.14	0.572	1
CI7-BZ#170	ND		ug/kg	1.14	0.572	1
CI7-BZ#180	0.883	J	ug/kg	1.14	0.572	1
CI7-BZ#183	ND		ug/kg	1.14	0.572	1
CI7-BZ#184	ND		ug/kg	1.14	0.572	1
CI7-BZ#187	0.757	J	ug/kg	1.14	0.572	1
CI8-BZ#195	ND		ug/kg	1.14	0.572	1
CI9-BZ#206	0.638	J	ug/kg	1.14	0.572	1
CI10-BZ#209	ND		ug/kg	1.14	0.572	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	89		30-150
BZ 198	68		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-15 D
 Client ID: CAD-1 0-4.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:34
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 04:42
 Analyst: GP
 Percent Solids: 43%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	92.9		ug/kg	54.1	27.0	5
Acenaphthylene	47.8	J	ug/kg	54.1	27.0	5
Acenaphthene	ND		ug/kg	54.1	27.0	5
Fluorene	37.2	J	ug/kg	54.1	27.0	5
Phenanthrene	250		ug/kg	54.1	27.0	5
Anthracene	91.0		ug/kg	54.1	27.0	5
Fluoranthene	769		ug/kg	54.1	27.0	5
Pyrene	893		ug/kg	54.1	27.0	5
Benz(a)anthracene	423		ug/kg	54.1	27.0	5
Chrysene	462		ug/kg	54.1	27.0	5
Benzo(b)fluoranthene	461		ug/kg	54.1	27.0	5
Benzo(k)fluoranthene	455		ug/kg	54.1	27.0	5
Benzo(a)pyrene	522		ug/kg	54.1	27.0	5
Indeno(1,2,3-cd)Pyrene	488		ug/kg	54.1	27.0	5
Dibenz(a,h)anthracene	89.2		ug/kg	54.1	27.0	5
Benzo(ghi)perylene	435		ug/kg	54.1	27.0	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	69		30-150
Pyrene-d10	80		30-150
Benzo(b)fluoranthene-d12	75		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-16
 Client ID: CAD-1 4.4-9.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 02:04
 Analyst: GP
 Percent Solids: 51%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	0.985	0.493	1
CI3-BZ#18	ND		ug/kg	0.985	0.493	1
CI3-BZ#28	ND		ug/kg	0.985	0.493	1
CI4-BZ#44	ND		ug/kg	0.985	0.493	1
CI4-BZ#49	ND		ug/kg	0.985	0.493	1
CI4-BZ#52	ND		ug/kg	0.985	0.493	1
CI4-BZ#66	ND		ug/kg	0.985	0.493	1
CI5-BZ#87	ND		ug/kg	0.985	0.493	1
CI5-BZ#101	ND		ug/kg	0.985	0.493	1
CI5-BZ#105	ND		ug/kg	0.985	0.493	1
CI5-BZ#118	ND		ug/kg	0.985	0.493	1
CI6-BZ#128	ND		ug/kg	0.985	0.493	1
CI6-BZ#138	ND		ug/kg	0.985	0.493	1
CI6-BZ#153	ND		ug/kg	0.985	0.493	1
CI7-BZ#170	ND		ug/kg	0.985	0.493	1
CI7-BZ#180	ND		ug/kg	0.985	0.493	1
CI7-BZ#183	ND		ug/kg	0.985	0.493	1
CI7-BZ#184	ND		ug/kg	0.985	0.493	1
CI7-BZ#187	ND		ug/kg	0.985	0.493	1
CI8-BZ#195	ND		ug/kg	0.985	0.493	1
CI9-BZ#206	ND		ug/kg	0.985	0.493	1
CI10-BZ#209	ND		ug/kg	0.985	0.493	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	93		30-150
BZ 198	75		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-16
 Client ID: CAD-1 4.4-9.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 20:15
 Analyst: GP
 Percent Solids: 51%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.27	4.63	1
Acenaphthylene	ND		ug/kg	9.27	4.63	1
Acenaphthene	ND		ug/kg	9.27	4.63	1
Fluorene	ND		ug/kg	9.27	4.63	1
Phenanthrene	8.47	J	ug/kg	9.27	4.63	1
Anthracene	ND		ug/kg	9.27	4.63	1
Fluoranthene	16.2		ug/kg	9.27	4.63	1
Pyrene	16.2		ug/kg	9.27	4.63	1
Benz(a)anthracene	8.61	J	ug/kg	9.27	4.63	1
Chrysene	7.87	J	ug/kg	9.27	4.63	1
Benzo(b)fluoranthene	8.37	J	ug/kg	9.27	4.63	1
Benzo(k)fluoranthene	5.78	J	ug/kg	9.27	4.63	1
Benzo(a)pyrene	8.76	J	ug/kg	9.27	4.63	1
Indeno(1,2,3-cd)Pyrene	10.6		ug/kg	9.27	4.63	1
Dibenz(a,h)anthracene	ND		ug/kg	9.27	4.63	1
Benzo(ghi)perylene	7.01	J	ug/kg	9.27	4.63	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	65		30-150
Pyrene-d10	88		30-150
Benzo(b)fluoranthene-d12	85		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-17
 Client ID: DS-1 0-7.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 02:37
 Analyst: GP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	ND		ug/kg	1.31	0.657	1
CI3-BZ#18	1.68		ug/kg	1.31	0.657	1
CI3-BZ#28	2.00		ug/kg	1.31	0.657	1
CI4-BZ#44	3.75		ug/kg	1.31	0.657	1
CI4-BZ#49	3.33		ug/kg	1.31	0.657	1
CI4-BZ#52	3.85		ug/kg	1.31	0.657	1
CI4-BZ#66	3.71		ug/kg	1.31	0.657	1
CI5-BZ#87	1.70		ug/kg	1.31	0.657	1
CI5-BZ#101	5.91		ug/kg	1.31	0.657	1
CI5-BZ#105	1.15	J	ug/kg	1.31	0.657	1
CI5-BZ#118	4.89		ug/kg	1.31	0.657	1
CI6-BZ#128	2.02		ug/kg	1.31	0.657	1
CI6-BZ#138	6.50		ug/kg	1.31	0.657	1
CI6-BZ#153	6.01		ug/kg	1.31	0.657	1
CI7-BZ#170	2.60		ug/kg	1.31	0.657	1
CI7-BZ#180	3.52		ug/kg	1.31	0.657	1
CI7-BZ#183	1.07	J	ug/kg	1.31	0.657	1
CI7-BZ#184	ND		ug/kg	1.31	0.657	1
CI7-BZ#187	3.20		ug/kg	1.31	0.657	1
CI8-BZ#195	1.03	J	ug/kg	1.31	0.657	1
CI9-BZ#206	1.44		ug/kg	1.31	0.657	1
CI10-BZ#209	0.884	J	ug/kg	1.31	0.657	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	118		30-150
BZ 198	96		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-17 D
 Client ID: DS-1 0-7.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 05:16
 Analyst: GP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	121		ug/kg	66.2	33.1	5
Acenaphthylene	38.1	J	ug/kg	66.2	33.1	5
Acenaphthene	ND		ug/kg	66.2	33.1	5
Fluorene	34.2	J	ug/kg	66.2	33.1	5
Phenanthrene	183		ug/kg	66.2	33.1	5
Anthracene	58.1	J	ug/kg	66.2	33.1	5
Fluoranthene	499		ug/kg	66.2	33.1	5
Pyrene	469		ug/kg	66.2	33.1	5
Benz(a)anthracene	230		ug/kg	66.2	33.1	5
Chrysene	291		ug/kg	66.2	33.1	5
Benzo(b)fluoranthene	292		ug/kg	66.2	33.1	5
Benzo(k)fluoranthene	307		ug/kg	66.2	33.1	5
Benzo(a)pyrene	273		ug/kg	66.2	33.1	5
Indeno(1,2,3-cd)Pyrene	302		ug/kg	66.2	33.1	5
Dibenz(a,h)anthracene	58.3	J	ug/kg	66.2	33.1	5
Benzo(ghi)perylene	251		ug/kg	66.2	33.1	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-150
Pyrene-d10	86		30-150
Benzo(b)fluoranthene-d12	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-18
 Client ID: DS-2 0-7.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 17:35
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 03/26/19 03:11
 Analyst: GP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 03/22/19 19:57
 Cleanup Method: EPA 3630
 Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI2-BZ#8	1.25	J	ug/kg	1.32	0.661	1
CI3-BZ#18	2.98		ug/kg	1.32	0.661	1
CI3-BZ#28	3.96		ug/kg	1.32	0.661	1
CI4-BZ#44	9.98		ug/kg	1.32	0.661	1
CI4-BZ#49	6.28		ug/kg	1.32	0.661	1
CI4-BZ#52	8.39		ug/kg	1.32	0.661	1
CI4-BZ#66	6.84		ug/kg	1.32	0.661	1
CI5-BZ#87	4.30		ug/kg	1.32	0.661	1
CI5-BZ#101	13.7		ug/kg	1.32	0.661	1
CI5-BZ#105	3.07		ug/kg	1.32	0.661	1
CI5-BZ#118	9.47		ug/kg	1.32	0.661	1
CI6-BZ#128	3.32		ug/kg	1.32	0.661	1
CI6-BZ#138	14.1		ug/kg	1.32	0.661	1
CI6-BZ#153	11.5		ug/kg	1.32	0.661	1
CI7-BZ#170	4.38		ug/kg	1.32	0.661	1
CI7-BZ#180	7.12		ug/kg	1.32	0.661	1
CI7-BZ#183	2.04		ug/kg	1.32	0.661	1
CI7-BZ#184	ND		ug/kg	1.32	0.661	1
CI7-BZ#187	6.78		ug/kg	1.32	0.661	1
CI8-BZ#195	0.812	J	ug/kg	1.32	0.661	1
CI9-BZ#206	2.46		ug/kg	1.32	0.661	1
CI10-BZ#209	1.01	J	ug/kg	1.32	0.661	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
DBOB	116		30-150
BZ 198	97		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-18 D
 Client ID: DS-2 0-7.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 17:35
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/16/18 05:50
 Analyst: GP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	947		ug/kg	65.2	32.6	5
Acenaphthylene	42.5	J	ug/kg	65.2	32.6	5
Acenaphthene	82.3		ug/kg	65.2	32.6	5
Fluorene	97.1		ug/kg	65.2	32.6	5
Phenanthrene	365		ug/kg	65.2	32.6	5
Anthracene	128		ug/kg	65.2	32.6	5
Fluoranthene	818		ug/kg	65.2	32.6	5
Pyrene	705		ug/kg	65.2	32.6	5
Benz(a)anthracene	377		ug/kg	65.2	32.6	5
Chrysene	446		ug/kg	65.2	32.6	5
Benzo(b)fluoranthene	421		ug/kg	65.2	32.6	5
Benzo(k)fluoranthene	293		ug/kg	65.2	32.6	5
Benzo(a)pyrene	337		ug/kg	65.2	32.6	5
Indeno(1,2,3-cd)Pyrene	317		ug/kg	65.2	32.6	5
Dibenz(a,h)anthracene	62.6	J	ug/kg	65.2	32.6	5
Benzo(ghi)perylene	286		ug/kg	65.2	32.6	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	68		30-150
Pyrene-d10	81		30-150
Benzo(b)fluoranthene-d12	77		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

**Method Blank Analysis
 Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 11/15/18 14:56
 Analyst: GP

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-18 Batch: WG1173138-1					
Naphthalene	ND		ug/kg	5.00	2.50
Acenaphthylene	ND		ug/kg	5.00	2.50
Acenaphthene	ND		ug/kg	5.00	2.50
Fluorene	ND		ug/kg	5.00	2.50
Phenanthrene	ND		ug/kg	5.00	2.50
Anthracene	ND		ug/kg	5.00	2.50
Fluoranthene	ND		ug/kg	5.00	2.50
Pyrene	ND		ug/kg	5.00	2.50
Benz(a)anthracene	ND		ug/kg	5.00	2.50
Chrysene	ND		ug/kg	5.00	2.50
Benzo(b)fluoranthene	ND		ug/kg	5.00	2.50
Benzo(k)fluoranthene	ND		ug/kg	5.00	2.50
Benzo(a)pyrene	ND		ug/kg	5.00	2.50
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	5.00	2.50
Dibenz(a,h)anthracene	ND		ug/kg	5.00	2.50
Benzo(ghi)perylene	ND		ug/kg	5.00	2.50

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	95		30-150
Benzo(b)fluoranthene-d12	97		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 03/25/19 12:35
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 03/22/19 19:57
Cleanup Method: EPA 3630
Cleanup Date: 03/24/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-18 Batch: WG1223124-1					
Cl2-BZ#8	ND		ug/kg	0.500	0.250
Cl3-BZ#18	ND		ug/kg	0.500	0.250
Cl3-BZ#28	ND		ug/kg	0.500	0.250
Cl4-BZ#44	ND		ug/kg	0.500	0.250
Cl4-BZ#49	ND		ug/kg	0.500	0.250
Cl4-BZ#52	ND		ug/kg	0.500	0.250
Cl4-BZ#66	ND		ug/kg	0.500	0.250
Cl5-BZ#87	ND		ug/kg	0.500	0.250
Cl5-BZ#101	ND		ug/kg	0.500	0.250
Cl5-BZ#105	ND		ug/kg	0.500	0.250
Cl5-BZ#118	ND		ug/kg	0.500	0.250
Cl6-BZ#128	ND		ug/kg	0.500	0.250
Cl6-BZ#138	ND		ug/kg	0.500	0.250
Cl6-BZ#153	ND		ug/kg	0.500	0.250
Cl7-BZ#170	ND		ug/kg	0.500	0.250
Cl7-BZ#180	ND		ug/kg	0.500	0.250
Cl7-BZ#183	ND		ug/kg	0.500	0.250
Cl7-BZ#184	ND		ug/kg	0.500	0.250
Cl7-BZ#187	ND		ug/kg	0.500	0.250
Cl8-BZ#195	ND		ug/kg	0.500	0.250
Cl9-BZ#206	ND		ug/kg	0.500	0.250
Cl10-BZ#209	ND		ug/kg	0.500	0.250

Surrogate	%Recovery	Qualifier	Acceptance Criteria
DBOB	95		30-150
BZ 198	79		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 Batch: WG1173138-2 WG1173138-3								
Naphthalene	71		74		50-120	4		30
Acenaphthylene	67		70		50-120	4		30
Acenaphthene	70		72		50-120	3		30
Fluorene	72		72		50-120	0		30
Phenanthrene	75		73		50-120	3		30
Anthracene	77		76		50-120	1		30
Fluoranthene	79		75		50-120	5		30
Pyrene	74		72		50-120	3		30
Benz(a)anthracene	86		84		50-120	2		30
Chrysene	77		76		50-120	1		30
Benzo(b)fluoranthene	90		89		50-120	1		30
Benzo(k)fluoranthene	77		78		50-120	1		30
Benzo(a)pyrene	83		81		50-120	2		30
Indeno(1,2,3-cd)Pyrene	95		96		50-120	1		30
Dibenz(a,h)anthracene	90		88		50-120	2		30
Benzo(ghi)perylene	85		83		50-120	2		30

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
2-Methylnaphthalene-d10	72		73		30-150
Pyrene-d10	85		82		30-150
Benzo(b)fluoranthene-d12	87		85		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 Batch: WG1223124-2 WG1223124-3								
Cl2-BZ#8	70		68		50-120	3		30
Cl3-BZ#18	70		69		50-120	1		30
Cl3-BZ#28	72		71		50-120	1		30
Cl4-BZ#44	76		75		50-120	1		30
Cl4-BZ#49	74		73		50-120	1		30
Cl4-BZ#52	72		71		50-120	1		30
Cl4-BZ#66	76		75		50-120	1		30
Cl5-BZ#87	77		76		50-120	1		30
Cl5-BZ#101	77		76		50-120	1		30
Cl5-BZ#105	80		78		50-120	3		30
Cl5-BZ#118	75		74		50-120	1		30
Cl6-BZ#128	78		77		50-120	1		30
Cl6-BZ#138	82		81		50-120	1		30
Cl6-BZ#153	77		76		50-120	1		30
Cl7-BZ#170	80		79		50-120	1		30
Cl7-BZ#180	77		75		50-120	3		30
Cl7-BZ#183	74		74		50-120	0		30
Cl7-BZ#184	76		76		50-120	0		30
Cl7-BZ#187	75		76		50-120	1		30
Cl8-BZ#195	83		81		50-120	2		30
Cl9-BZ#206	84		82		50-120	2		30
Cl10-BZ#209	80		79		50-120	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 Batch: WG1223124-2 WG1223124-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
DBOB	89		88		30-150
BZ 198	78		78		30-150

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab ID: US-1 0-5.5 Associated sample(s): 01-18 QC Batch ID: WG1173138-6 WG1173138-7 QC Sample: L1843305-07 Client												
Naphthalene	75.2	645	597	81		586	80		50-120	2		30
Acenaphthylene	52.7J	645	553	86		535	83		50-120	3		30
Acenaphthene	51.4J	645	570	88		537	84		50-120	6		30
Fluorene	55.9J	645	592	92		552	86		50-120	7		30
Phenanthrene	323	645	826	78		800	74		50-120	3		30
Anthracene	104	645	685	90		643	84		50-120	6		30
Fluoranthene	1110	645	1630	81		1580	73		50-120	3		30
Pyrene	954	645	1480	82		1460	79		50-120	1		30
Benz(a)anthracene	511	645	1070	87		1090	90		50-120	2		30
Chrysene	624	645	1130	78		1100	74		50-120	3		30
Benzo(b)fluoranthene	595	645	1150	86		1130	83		50-120	2		30
Benzo(k)fluoranthene	488	645	1070	90		1070	91		50-120	0		30
Benzo(a)pyrene	522	645	1100	90		1090	88		50-120	1		30
Indeno(1,2,3-cd)Pyrene	520	645	1160	99		1120	93		50-120	4		30
Dibenz(a,h)anthracene	89.4	645	782	107		746	102		50-120	5		30
Benzo(ghi)perylene	439	645	1040	93		989	86		50-120	5		30

<i>Surrogate</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
2-Methylnaphthalene-d10	81		79		30-150
Benzo(b)fluoranthene-d12	93		89		30-150
Pyrene-d10	98		94		30-150

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1223124-5 WG1223124-6 QC Sample: L1843305-07 Client ID: US-1 0-5.5												
CI2-BZ#8	ND	137	89.5	65		89.8	67		50-120	0		30
CI3-BZ#18	1.44	137	87.9	63		88.1	64		50-120	0		30
CI3-BZ#28	ND	137	90.1	66		91.6	68		50-120	2		30
CI4-BZ#44	0.779J	137	96.4	71		97.1	72		50-120	1		30
CI4-BZ#49	0.802J	137	85.4	62		84.8	63		50-120	1		30
CI4-BZ#52	1.25J	137	99.4	73		99.9	74		50-120	1		30
CI4-BZ#66	0.801J	137	97.3	71		97.3	72		50-120	0		30
CI5-BZ#87	1.43	137	99.3	72		99.0	72		50-120	0		30
CI5-BZ#101	2.66	137	100	71		108	78		50-120	8		30
CI5-BZ#105	0.918J	137	97.7	71		99.6	74		50-120	2		30
CI5-BZ#118	2.37	137	94.5	67		94.6	68		50-120	0		30
CI6-BZ#128	0.963J	137	107	78		107	79		50-120	0		30
CI6-BZ#138	3.38	137	114	81		113	81		50-120	1		30
CI6-BZ#153	2.48	137	104	74		104	75		50-120	0		30
CI7-BZ#170	ND	137	117	86		118	88		50-120	1		30
CI7-BZ#180	1.54	137	102	73		102	75		50-120	0		30
CI7-BZ#183	ND	137	93.7	69		96.3	71		50-120	3		30
CI7-BZ#184	ND	137	101	74		101	75		50-120	0		30
CI7-BZ#187	0.922J	137	118	86		114	85		50-120	3		30
CI8-BZ#195	ND	137	128	94		126	93		50-120	2		30
CI9-BZ#206	ND	137	125	91		124	92		50-120	1		30
CI10-BZ#209	ND	137	113	83		113	84		50-120	0		30

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1223124-5 WG1223124-6 QC Sample: L1843305-07 Client ID: US-1 0-5.5												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
BZ 198	90		92		30-150
DBOB	110		108		30-150



Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1173138-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Naphthalene	75.2	74.1	ug/kg	1		30
Acenaphthylene	52.7J	44.5J	ug/kg	NC		30
Acenaphthene	51.4J	38.8J	ug/kg	NC		30
Fluorene	55.9J	52.3J	ug/kg	NC		30
Phenanthrene	323	298	ug/kg	8		30
Anthracene	104	128	ug/kg	21		30
Fluoranthene	1110	938	ug/kg	17		30
Pyrene	954	805	ug/kg	17		30
Benz(a)anthracene	511	428	ug/kg	18		30
Chrysene	624	595	ug/kg	5		30
Benzo(b)fluoranthene	595	531	ug/kg	11		30
Benzo(k)fluoranthene	488	430	ug/kg	13		30
Benzo(a)pyrene	522	458	ug/kg	13		30
Indeno(1,2,3-cd)Pyrene	520	458	ug/kg	13		30
Dibenz(a,h)anthracene	89.4	89.0	ug/kg	0		30
Benzo(ghi)perylene	439	390	ug/kg	12		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		74		30-150
Pyrene-d10	97		87		30-150
Benzo(b)fluoranthene-d12	92		81		30-150

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 5.0

Lab Number: L1843305

Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1223124-4 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
CI2-BZ#8	ND	ND	ug/kg	NC		30
CI3-BZ#18	1.44	ND	ug/kg	NC		30
CI3-BZ#28	ND	ND	ug/kg	NC		30
CI4-BZ#44	0.779J	0.806J	ug/kg	NC		30
CI4-BZ#49	0.802J	ND	ug/kg	NC		30
CI4-BZ#52	1.25J	1.02J	ug/kg	NC		30
CI4-BZ#66	0.801J	ND	ug/kg	NC		30
CI5-BZ#87	1.43	0.755J	ug/kg	NC		30
CI5-BZ#101	2.66	1.74	ug/kg	42	Q	30
CI5-BZ#105	0.918J	ND	ug/kg	NC		30
CI5-BZ#118	2.37	1.48	ug/kg	46	Q	30
CI6-BZ#128	0.963J	ND	ug/kg	NC		30
CI6-BZ#138	3.38	2.00	ug/kg	51	Q	30
CI6-BZ#153	2.48	1.57	ug/kg	45	Q	30
CI7-BZ#170	ND	0.684J	ug/kg	NC		30
CI7-BZ#180	1.54	0.960J	ug/kg	NC		30
CI7-BZ#183	ND	ND	ug/kg	NC		30
CI7-BZ#184	ND	ND	ug/kg	NC		30
CI7-BZ#187	0.922J	0.689J	ug/kg	NC		30
CI8-BZ#195	ND	ND	ug/kg	NC		30
CI9-BZ#206	ND	ND	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1223124-4 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Cl10-BZ#209	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
DBOB	105		82		30-150
BZ 198	86		66		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1173138-4

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	56		40-140
Fluoranthene	55		40-140
Pyrene	50		40-140
Benz(a)anthracene	55		40-140
Chrysene	68		40-140
Benzo(b)fluoranthene	57		40-140
Benzo(k)fluoranthene	97		40-140
Benzo(a)pyrene	49		40-140
Indeno(1,2,3-cd)Pyrene	70		40-140
Dibenz(a,h)anthracene	110		40-140
Benzo(ghi)perylene	61		40-140
2-Methylnaphthalene-d10 (Surrogate)	62		30-150
Pyrene-d10 (Surrogate)	73		30-150
Benzo(b)fluoranthene-d12 (Surrogate)	66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1223124-7

Parameter	% Recovery	Qual	QC Criteria
CI2-BZ#8	53		40-140
CI3-BZ#18	47		40-140
CI3-BZ#28	42		40-140
CI4-BZ#44	73		40-140
CI4-BZ#49	50		40-140
CI4-BZ#52	51		40-140
CI4-BZ#66	42		40-140
CI5-BZ#87	55		40-140
CI5-BZ#101	56		40-140
CI5-BZ#105	50		40-140
CI5-BZ#118	50		40-140
CI6-BZ#128	74		40-140
CI6-BZ#138	62		40-140
CI6-BZ#153	40		40-140
CI7-BZ#170	62		40-140
CI7-BZ#180	48		40-140
CI7-BZ#183	46		40-140
CI7-BZ#187	69		40-140
CI9-BZ#206	63		40-140
CI10-BZ#209	65		40-140
DBOB (Surrogate)	78		30-150
BZ 198 (Surrogate)	70		30-150

PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-01
 Client ID: TB-2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 16:50
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/13/18 22:44
 Analyst: DP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.31	1.31	1	A
gamma-BHC	ND		ug/kg	0.656	0.656	1	A
Heptachlor	ND		ug/kg	0.656	0.656	1	A
Aldrin	ND		ug/kg	0.656	0.656	1	A
Heptachlor epoxide	ND		ug/kg	1.31	1.31	1	B
Oxychlorane	3.73		ug/kg	1.31	1.31	1	B
trans-Chlordane	5.78	P	ug/kg	0.656	0.656	1	A
Endosulfan I	ND		ug/kg	0.656	0.656	1	A
cis-Chlordane	ND		ug/kg	0.656	0.656	1	A
trans-Nonachlor	ND		ug/kg	0.656	0.656	1	B
4,4'-DDE	1.93		ug/kg	0.656	0.656	1	A
Dieldrin	1.79	P	ug/kg	0.656	0.656	1	B
Endrin	ND		ug/kg	0.656	0.656	1	A
Endosulfan II	ND		ug/kg	0.656	0.656	1	B
4,4'-DDD	0.932		ug/kg	0.656	0.656	1	A
cis-Nonachlor	ND		ug/kg	0.656	0.656	1	B
4,4'-DDT	2.14	P	ug/kg	0.656	0.656	1	B
Methoxychlor	ND		ug/kg	2.62	2.62	1	B
Toxaphene	ND		ug/kg	32.9	32.9	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	65		30-150	B
BZ 198	74		30-150	B
DBOB	77		30-150	A
BZ 198	79		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-02
 Client ID: US-2 0.0-5.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 17:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/13/18 23:18
 Analyst: DP
 Percent Solids: 42%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.14	1.14	1	A
gamma-BHC	1.23		ug/kg	0.571	0.571	1	B
Heptachlor	ND		ug/kg	0.571	0.571	1	A
Aldrin	ND		ug/kg	0.571	0.571	1	A
Heptachlor epoxide	ND		ug/kg	1.14	1.14	1	B
Oxychlorane	10.6		ug/kg	1.14	1.14	1	B
trans-Chlordane	36.0	P	ug/kg	0.571	0.571	1	A
Endosulfan I	ND		ug/kg	0.571	0.571	1	A
cis-Chlordane	1.49	P	ug/kg	0.571	0.571	1	A
trans-Nonachlor	3.65	P	ug/kg	0.571	0.571	1	A
4,4'-DDE	6.16		ug/kg	0.571	0.571	1	A
Dieldrin	1.12	IP	ug/kg	0.571	0.571	1	A
Endrin	ND		ug/kg	0.571	0.571	1	A
Endosulfan II	10.2	P	ug/kg	0.571	0.571	1	A
4,4'-DDD	1.84		ug/kg	0.571	0.571	1	A
cis-Nonachlor	1.85	P	ug/kg	0.571	0.571	1	B
4,4'-DDT	4.70	IP	ug/kg	0.571	0.571	1	A
Methoxychlor	7.97	P	ug/kg	2.28	2.28	1	B
Toxaphene	ND		ug/kg	28.6	28.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	72		30-150	B
BZ 198	78		30-150	B
DBOB	85		30-150	A
BZ 198	85		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-03
 Client ID: US-2 5.0-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/22/18 15:17
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/13/18 23:52
 Analyst: DP
 Percent Solids: 75%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.20	1.20	1	A
gamma-BHC	ND		ug/kg	0.599	0.599	1	A
Heptachlor	ND		ug/kg	0.599	0.599	1	A
Aldrin	ND		ug/kg	0.599	0.599	1	A
Heptachlor epoxide	ND		ug/kg	1.20	1.20	1	B
Oxychlordane	ND		ug/kg	1.20	1.20	1	B
trans-Chlordane	ND		ug/kg	0.599	0.599	1	A
Endosulfan I	ND		ug/kg	0.599	0.599	1	A
cis-Chlordane	ND		ug/kg	0.599	0.599	1	A
trans-Nonachlor	ND		ug/kg	0.599	0.599	1	A
4,4'-DDE	ND		ug/kg	0.599	0.599	1	A
Dieldrin	ND		ug/kg	0.599	0.599	1	A
Endrin	ND		ug/kg	0.599	0.599	1	A
Endosulfan II	ND		ug/kg	0.599	0.599	1	A
4,4'-DDD	ND		ug/kg	0.599	0.599	1	A
cis-Nonachlor	ND		ug/kg	0.599	0.599	1	A
4,4'-DDT	ND		ug/kg	0.599	0.599	1	A
Methoxychlor	ND		ug/kg	2.40	2.40	1	A
Toxaphene	ND		ug/kg	30.1	30.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	56		30-150	B
BZ 198	65		30-150	B
DBOB	60		30-150	A
BZ 198	65		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-04
 Client ID: TB-1 0-5.2
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 00:26
 Analyst: DP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.32	1.32	1	A
gamma-BHC	ND		ug/kg	0.662	0.662	1	A
Heptachlor	ND		ug/kg	0.662	0.662	1	A
Aldrin	ND		ug/kg	0.662	0.662	1	A
Heptachlor epoxide	ND		ug/kg	1.32	1.32	1	B
Oxychlordane	3.24		ug/kg	1.32	1.32	1	B
trans-Chlordane	5.12	P	ug/kg	0.662	0.662	1	A
Endosulfan I	ND		ug/kg	0.662	0.662	1	A
cis-Chlordane	ND		ug/kg	0.662	0.662	1	B
trans-Nonachlor	ND		ug/kg	0.662	0.662	1	B
4,4'-DDE	2.03		ug/kg	0.662	0.662	1	A
Dieldrin	ND	I	ug/kg	0.662	0.662	1	A
Endrin	ND		ug/kg	0.662	0.662	1	A
Endosulfan II	1.46	P	ug/kg	0.662	0.662	1	A
4,4'-DDD	0.704		ug/kg	0.662	0.662	1	A
cis-Nonachlor	ND		ug/kg	0.662	0.662	1	B
4,4'-DDT	0.691	IP	ug/kg	0.662	0.662	1	A
Methoxychlor	ND		ug/kg	2.65	2.65	1	A
Toxaphene	ND		ug/kg	33.2	33.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	B
BZ 198	69		30-150	B
DBOB	77		30-150	A
BZ 198	66		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-05
 Client ID: TB-1 5.2-6.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 10:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 01:00
 Analyst: DP
 Percent Solids: 73%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.31	1.31	1	A
gamma-BHC	ND		ug/kg	0.654	0.654	1	A
Heptachlor	ND		ug/kg	0.654	0.654	1	A
Aldrin	ND		ug/kg	0.654	0.654	1	A
Heptachlor epoxide	ND		ug/kg	1.31	1.31	1	B
Oxychlordane	ND		ug/kg	1.31	1.31	1	B
trans-Chlordane	ND		ug/kg	0.654	0.654	1	B
Endosulfan I	ND		ug/kg	0.654	0.654	1	A
cis-Chlordane	ND		ug/kg	0.654	0.654	1	A
trans-Nonachlor	ND		ug/kg	0.654	0.654	1	A
4,4'-DDE	ND		ug/kg	0.654	0.654	1	A
Dieldrin	ND		ug/kg	0.654	0.654	1	B
Endrin	ND		ug/kg	0.654	0.654	1	A
Endosulfan II	ND		ug/kg	0.654	0.654	1	A
4,4'-DDD	ND		ug/kg	0.654	0.654	1	B
cis-Nonachlor	ND		ug/kg	0.654	0.654	1	A
4,4'-DDT	ND		ug/kg	0.654	0.654	1	A
Methoxychlor	ND		ug/kg	2.61	2.61	1	A
Toxaphene	ND		ug/kg	32.8	32.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	71		30-150	B
BZ 198	80		30-150	B
DBOB	74		30-150	A
BZ 198	76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-06
 Client ID: CAD-3 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 01:34
 Analyst: DP
 Percent Solids: 46%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.05	1.05	1	A
gamma-BHC	ND		ug/kg	0.524	0.524	1	A
Heptachlor	ND		ug/kg	0.524	0.524	1	A
Aldrin	ND		ug/kg	0.524	0.524	1	A
Heptachlor epoxide	ND		ug/kg	1.05	1.05	1	B
Oxychlordane	ND		ug/kg	1.05	1.05	1	B
trans-Chlordane	1.36	P	ug/kg	0.524	0.524	1	A
Endosulfan I	ND		ug/kg	0.524	0.524	1	A
cis-Chlordane	ND		ug/kg	0.524	0.524	1	B
trans-Nonachlor	ND		ug/kg	0.524	0.524	1	A
4,4'-DDE	0.926		ug/kg	0.524	0.524	1	A
Dieldrin	0.533	IP	ug/kg	0.524	0.524	1	A
Endrin	ND		ug/kg	0.524	0.524	1	A
Endosulfan II	0.989	P	ug/kg	0.524	0.524	1	A
4,4'-DDD	2.05		ug/kg	0.524	0.524	1	A
cis-Nonachlor	ND		ug/kg	0.524	0.524	1	B
4,4'-DDT	0.541	IP	ug/kg	0.524	0.524	1	A
Methoxychlor	3.71		ug/kg	2.10	2.10	1	B
Toxaphene	ND		ug/kg	26.3	26.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	62		30-150	B
BZ 198	65		30-150	B
DBOB	73		30-150	A
BZ 198	66		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-07
 Client ID: US-1 0-5.5
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:24
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 02:08
 Analyst: DP
 Percent Solids: 36%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.26	1.26	1	A
gamma-BHC	0.998	P	ug/kg	0.631	0.631	1	B
Heptachlor	ND		ug/kg	0.631	0.631	1	A
Aldrin	ND		ug/kg	0.631	0.631	1	A
Heptachlor epoxide	ND		ug/kg	1.26	1.26	1	B
Oxychlordane	5.85		ug/kg	1.26	1.26	1	B
trans-Chlordane	17.6	P	ug/kg	0.631	0.631	1	A
Endosulfan I	ND		ug/kg	0.631	0.631	1	A
cis-Chlordane	1.38		ug/kg	0.631	0.631	1	A
trans-Nonachlor	1.86	P	ug/kg	0.631	0.631	1	A
4,4'-DDE	3.77	P	ug/kg	0.631	0.631	1	A
Dieldrin	1.25	IP	ug/kg	0.631	0.631	1	A
Endrin	ND		ug/kg	0.631	0.631	1	A
Endosulfan II	3.97	P	ug/kg	0.631	0.631	1	A
4,4'-DDD	1.56		ug/kg	0.631	0.631	1	A
cis-Nonachlor	0.687		ug/kg	0.631	0.631	1	A
4,4'-DDT	3.42	P	ug/kg	0.631	0.631	1	B
Methoxychlor	3.89		ug/kg	2.52	2.52	1	B
Toxaphene	ND		ug/kg	31.7	31.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	B
BZ 198	76		30-150	B
DBOB	85		30-150	A
BZ 198	79		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-08
 Client ID: CAD-2 0.5.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 13:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 04:24
 Analyst: DP
 Percent Solids: 44%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.08	1.08	1	A
gamma-BHC	ND		ug/kg	0.540	0.540	1	A
Heptachlor	ND		ug/kg	0.540	0.540	1	A
Aldrin	ND		ug/kg	0.540	0.540	1	A
Heptachlor epoxide	ND		ug/kg	1.08	1.08	1	B
Oxychlordane	ND		ug/kg	1.08	1.08	1	B
trans-Chlordane	1.42		ug/kg	0.540	0.540	1	A
Endosulfan I	ND		ug/kg	0.540	0.540	1	A
cis-Chlordane	ND		ug/kg	0.540	0.540	1	A
trans-Nonachlor	ND		ug/kg	0.540	0.540	1	A
4,4'-DDE	0.942		ug/kg	0.540	0.540	1	A
Dieldrin	ND		ug/kg	0.540	0.540	1	A
Endrin	ND		ug/kg	0.540	0.540	1	A
Endosulfan II	0.887	P	ug/kg	0.540	0.540	1	A
4,4'-DDD	ND		ug/kg	0.540	0.540	1	A
cis-Nonachlor	ND		ug/kg	0.540	0.540	1	A
4,4'-DDT	ND		ug/kg	0.540	0.540	1	A
Methoxychlor	ND		ug/kg	2.16	2.16	1	A
Toxaphene	ND		ug/kg	27.1	27.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	61		30-150	B
BZ 198	65		30-150	B
DBOB	80		30-150	A
BZ 198	62		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-09
 Client ID: CAD-2 5.3-10.8
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 14:20
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 04:58
 Analyst: DP
 Percent Solids: 50%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.913	0.913	1	A
gamma-BHC	ND		ug/kg	0.456	0.456	1	A
Heptachlor	ND		ug/kg	0.456	0.456	1	A
Aldrin	ND		ug/kg	0.456	0.456	1	A
Heptachlor epoxide	ND		ug/kg	0.913	0.913	1	B
Oxychlordane	16.4		ug/kg	0.913	0.913	1	B
trans-Chlordane	ND		ug/kg	0.456	0.456	1	A
Endosulfan I	ND		ug/kg	0.456	0.456	1	A
cis-Chlordane	ND		ug/kg	0.456	0.456	1	A
trans-Nonachlor	ND		ug/kg	0.456	0.456	1	A
4,4'-DDE	ND		ug/kg	0.456	0.456	1	A
Dieldrin	ND		ug/kg	0.456	0.456	1	A
Endrin	ND		ug/kg	0.456	0.456	1	A
Endosulfan II	ND		ug/kg	0.456	0.456	1	A
4,4'-DDD	ND		ug/kg	0.456	0.456	1	A
cis-Nonachlor	ND		ug/kg	0.456	0.456	1	A
4,4'-DDT	ND		ug/kg	0.456	0.456	1	A
Methoxychlor	ND		ug/kg	1.82	1.82	1	A
Toxaphene	ND		ug/kg	22.9	22.9	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	B
BZ 198	77		30-150	B
DBOB	83		30-150	A
BZ 198	72		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-10
 Client ID: W1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:10
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 05:32
 Analyst: DP
 Percent Solids: 39%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.19	1.19	1	A
gamma-BHC	1.54		ug/kg	0.595	0.595	1	B
Heptachlor	ND		ug/kg	0.595	0.595	1	A
Aldrin	ND		ug/kg	0.595	0.595	1	A
Heptachlor epoxide	ND		ug/kg	1.19	1.19	1	B
Oxychlordane	12.3		ug/kg	1.19	1.19	1	B
trans-Chlordane	56.3	P	ug/kg	0.595	0.595	1	A
Endosulfan I	ND		ug/kg	0.595	0.595	1	A
cis-Chlordane	2.16		ug/kg	0.595	0.595	1	A
trans-Nonachlor	ND		ug/kg	0.595	0.595	1	A
4,4'-DDE	5.72		ug/kg	0.595	0.595	1	A
Dieldrin	1.12	IP	ug/kg	0.595	0.595	1	A
Endrin	ND		ug/kg	0.595	0.595	1	A
Endosulfan II	12.4	P	ug/kg	0.595	0.595	1	A
4,4'-DDD	1.83		ug/kg	0.595	0.595	1	A
cis-Nonachlor	1.89	P	ug/kg	0.595	0.595	1	B
4,4'-DDT	6.96	I	ug/kg	0.595	0.595	1	A
Methoxychlor	7.88	P	ug/kg	2.38	2.38	1	B
Toxaphene	ND		ug/kg	29.9	29.9	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	75		30-150	B
BZ 198	84		30-150	B
DBOB	94		30-150	A
BZ 198	86		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-11
 Client ID: V1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 11:31
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 06:06
 Analyst: DP
 Percent Solids: 32%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.49	1.49	1	A
gamma-BHC	ND		ug/kg	0.747	0.747	1	A
Heptachlor	ND		ug/kg	0.747	0.747	1	A
Aldrin	ND		ug/kg	0.747	0.747	1	A
Heptachlor epoxide	ND		ug/kg	1.49	1.49	1	B
Oxychlorane	3.66		ug/kg	1.49	1.49	1	B
trans-Chlordane	4.62	P	ug/kg	0.747	0.747	1	A
Endosulfan I	ND		ug/kg	0.747	0.747	1	A
cis-Chlordane	0.825		ug/kg	0.747	0.747	1	A
trans-Nonachlor	ND		ug/kg	0.747	0.747	1	B
4,4'-DDE	1.62		ug/kg	0.747	0.747	1	A
Dieldrin	0.954	IP	ug/kg	0.747	0.747	1	A
Endrin	ND		ug/kg	0.747	0.747	1	A
Endosulfan II	1.29	P	ug/kg	0.747	0.747	1	A
4,4'-DDD	0.770		ug/kg	0.747	0.747	1	A
cis-Nonachlor	ND		ug/kg	0.747	0.747	1	A
4,4'-DDT	0.768	IP	ug/kg	0.747	0.747	1	A
Methoxychlor	ND		ug/kg	2.99	2.99	1	B
Toxaphene	ND		ug/kg	37.5	37.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	68		30-150	B
BZ 198	66		30-150	B
DBOB	92		30-150	A
BZ 198	68		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-12
 Client ID: S1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:25
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 06:40
 Analyst: DP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.19	1.19	1	A
gamma-BHC	0.883		ug/kg	0.597	0.597	1	B
Heptachlor	ND		ug/kg	0.597	0.597	1	A
Aldrin	ND		ug/kg	0.597	0.597	1	A
Heptachlor epoxide	ND		ug/kg	1.19	1.19	1	B
Oxychlorane	6.41		ug/kg	1.19	1.19	1	B
trans-Chlordane	27.0	P	ug/kg	0.597	0.597	1	A
Endosulfan I	ND		ug/kg	0.597	0.597	1	A
cis-Chlordane	0.754		ug/kg	0.597	0.597	1	A
trans-Nonachlor	1.97	P	ug/kg	0.597	0.597	1	A
4,4'-DDE	4.20		ug/kg	0.597	0.597	1	A
Dieldrin	1.20	IP	ug/kg	0.597	0.597	1	A
Endrin	ND		ug/kg	0.597	0.597	1	A
Endosulfan II	6.30	P	ug/kg	0.597	0.597	1	A
4,4'-DDD	1.30		ug/kg	0.597	0.597	1	A
cis-Nonachlor	0.934	P	ug/kg	0.597	0.597	1	B
4,4'-DDT	3.44	IP	ug/kg	0.597	0.597	1	A
Methoxychlor	3.44	P	ug/kg	2.39	2.39	1	B
Toxaphene	ND		ug/kg	30.0	30.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	76		30-150	B
BZ 198	72		30-150	B
DBOB	90		30-150	A
BZ 198	83		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-13
 Client ID: R1
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 12:39
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 07:14
 Analyst: DP
 Percent Solids: 41%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.17	1.17	1	A
gamma-BHC	0.688	P	ug/kg	0.585	0.585	1	A
Heptachlor	ND		ug/kg	0.585	0.585	1	A
Aldrin	ND		ug/kg	0.585	0.585	1	A
Heptachlor epoxide	ND		ug/kg	1.17	1.17	1	B
Oxychlordane	7.92		ug/kg	1.17	1.17	1	B
trans-Chlordane	28.1	P	ug/kg	0.585	0.585	1	A
Endosulfan I	ND		ug/kg	0.585	0.585	1	A
cis-Chlordane	1.04		ug/kg	0.585	0.585	1	A
trans-Nonachlor	2.99	P	ug/kg	0.585	0.585	1	A
4,4'-DDE	4.66	P	ug/kg	0.585	0.585	1	A
Dieldrin	0.953	IP	ug/kg	0.585	0.585	1	A
Endrin	ND		ug/kg	0.585	0.585	1	A
Endosulfan II	5.46	P	ug/kg	0.585	0.585	1	A
4,4'-DDD	1.21		ug/kg	0.585	0.585	1	A
cis-Nonachlor	1.52	P	ug/kg	0.585	0.585	1	B
4,4'-DDT	3.40	I	ug/kg	0.585	0.585	1	A
Methoxychlor	6.14	P	ug/kg	2.34	2.34	1	B
Toxaphene	ND		ug/kg	29.4	29.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	75		30-150	B
BZ 198	78		30-150	B
DBOB	110		30-150	A
BZ 198	89		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-14
 Client ID: CAD-3 6.1-9.9
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 15:00
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 07:48
 Analyst: DP
 Percent Solids: 55%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.843	0.843	1	A
gamma-BHC	ND		ug/kg	0.421	0.421	1	A
Heptachlor	ND		ug/kg	0.421	0.421	1	A
Aldrin	ND		ug/kg	0.421	0.421	1	A
Heptachlor epoxide	ND		ug/kg	0.843	0.843	1	B
Oxychlorane	ND		ug/kg	0.843	0.843	1	B
trans-Chlordane	ND		ug/kg	0.421	0.421	1	A
Endosulfan I	ND		ug/kg	0.421	0.421	1	A
cis-Chlordane	ND		ug/kg	0.421	0.421	1	A
trans-Nonachlor	ND		ug/kg	0.421	0.421	1	A
4,4'-DDE	ND		ug/kg	0.421	0.421	1	A
Dieldrin	ND		ug/kg	0.421	0.421	1	A
Endrin	ND		ug/kg	0.421	0.421	1	A
Endosulfan II	ND		ug/kg	0.421	0.421	1	A
4,4'-DDD	ND		ug/kg	0.421	0.421	1	A
cis-Nonachlor	ND		ug/kg	0.421	0.421	1	A
4,4'-DDT	ND		ug/kg	0.421	0.421	1	A
Methoxychlor	ND		ug/kg	1.68	1.68	1	A
Toxaphene	ND		ug/kg	21.2	21.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	B
BZ 198	66		30-150	B
DBOB	72		30-150	A
BZ 198	64		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

SAMPLE RESULTS

Lab ID: L1843305-15
 Client ID: CAD-1 0-4.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:34
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/14/18 08:22
 Analyst: DP
 Percent Solids: 43%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.08	1.08	1	A
gamma-BHC	ND		ug/kg	0.541	0.541	1	A
Heptachlor	ND		ug/kg	0.541	0.541	1	A
Aldrin	ND		ug/kg	0.541	0.541	1	A
Heptachlor epoxide	ND		ug/kg	1.08	1.08	1	B
Oxychlordane	4.20		ug/kg	1.08	1.08	1	B
trans-Chlordane	3.25	P	ug/kg	0.541	0.541	1	A
Endosulfan I	ND		ug/kg	0.541	0.541	1	A
cis-Chlordane	ND		ug/kg	0.541	0.541	1	B
trans-Nonachlor	0.666		ug/kg	0.541	0.541	1	B
4,4'-DDE	1.52		ug/kg	0.541	0.541	1	A
Dieldrin	ND		ug/kg	0.541	0.541	1	A
Endrin	ND		ug/kg	0.541	0.541	1	A
Endosulfan II	1.38	P	ug/kg	0.541	0.541	1	A
4,4'-DDD	ND		ug/kg	0.541	0.541	1	A
cis-Nonachlor	ND		ug/kg	0.541	0.541	1	B
4,4'-DDT	ND		ug/kg	0.541	0.541	1	A
Methoxychlor	3.60		ug/kg	2.16	2.16	1	B
Toxaphene	ND		ug/kg	27.2	27.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	71		30-150	B
BZ 198	73		30-150	B
DBOB	86		30-150	A
BZ 198	78		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-16
 Client ID: CAD-1 4.4-9.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:30
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/19/18 11:44
 Analyst: DP
 Percent Solids: 51%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.927	0.927	1	A
gamma-BHC	ND		ug/kg	0.463	0.463	1	A
Heptachlor	ND		ug/kg	0.463	0.463	1	A
Aldrin	ND		ug/kg	0.463	0.463	1	A
Heptachlor epoxide	ND		ug/kg	0.927	0.927	1	B
Oxychlordane	ND		ug/kg	0.927	0.927	1	B
trans-Chlordane	ND		ug/kg	0.463	0.463	1	B
Endosulfan I	ND		ug/kg	0.463	0.463	1	B
cis-Chlordane	ND		ug/kg	0.463	0.463	1	B
trans-Nonachlor	ND		ug/kg	0.463	0.463	1	B
4,4'-DDE	ND		ug/kg	0.463	0.463	1	A
Dieldrin	ND		ug/kg	0.463	0.463	1	B
Endrin	ND		ug/kg	0.463	0.463	1	A
Endosulfan II	ND		ug/kg	0.463	0.463	1	A
4,4'-DDD	ND		ug/kg	0.463	0.463	1	A
cis-Nonachlor	ND		ug/kg	0.463	0.463	1	B
4,4'-DDT	ND		ug/kg	0.463	0.463	1	B
Methoxychlor	ND		ug/kg	1.85	1.85	1	B
Toxaphene	ND		ug/kg	23.3	23.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	65		30-150	B
BZ 198	81		30-150	B
DBOB	72		30-150	A
BZ 198	78		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-17
 Client ID: DS-1 0-7.3
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 16:15
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/19/18 12:18
 Analyst: DP
 Percent Solids: 37%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.32	1.32	1	A
gamma-BHC	ND		ug/kg	0.662	0.662	1	A
Heptachlor	ND		ug/kg	0.662	0.662	1	A
Aldrin	ND		ug/kg	0.662	0.662	1	A
Heptachlor epoxide	ND		ug/kg	1.32	1.32	1	B
Oxychlorane	3.81		ug/kg	1.32	1.32	1	B
trans-Chlordane	7.57	P	ug/kg	0.662	0.662	1	A
Endosulfan I	ND		ug/kg	0.662	0.662	1	A
cis-Chlordane	ND		ug/kg	0.662	0.662	1	B
trans-Nonachlor	0.721		ug/kg	0.662	0.662	1	A
4,4'-DDE	3.60		ug/kg	0.662	0.662	1	A
Dieldrin	0.799	IP	ug/kg	0.662	0.662	1	A
Endrin	ND		ug/kg	0.662	0.662	1	A
Endosulfan II	2.92	P	ug/kg	0.662	0.662	1	A
4,4'-DDD	0.909		ug/kg	0.662	0.662	1	A
cis-Nonachlor	ND		ug/kg	0.662	0.662	1	B
4,4'-DDT	1.36	IP	ug/kg	0.662	0.662	1	A
Methoxychlor	ND		ug/kg	2.65	2.65	1	B
Toxaphene	ND		ug/kg	33.2	33.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	63		30-150	B
BZ 198	75		30-150	B
DBOB	80		30-150	A
BZ 198	72		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-18
 Client ID: DS-2 0-7.0
 Sample Location: NEW HAVEN, CT

Date Collected: 10/23/18 17:35
 Date Received: 10/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8081B
 Analytical Date: 11/19/18 12:52
 Analyst: DP
 Percent Solids: 38%

Extraction Method: EPA 3570
 Extraction Date: 10/28/18 11:09
 Cleanup Method: EPA 3630
 Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	1.30	1.30	1	A
gamma-BHC	ND		ug/kg	0.652	0.652	1	A
Heptachlor	ND		ug/kg	0.652	0.652	1	A
Aldrin	ND		ug/kg	0.652	0.652	1	A
Heptachlor epoxide	ND		ug/kg	1.30	1.30	1	B
Oxychlordane	4.82		ug/kg	1.30	1.30	1	B
trans-Chlordane	8.37	P	ug/kg	0.652	0.652	1	A
Endosulfan I	ND		ug/kg	0.652	0.652	1	A
cis-Chlordane	ND		ug/kg	0.652	0.652	1	B
trans-Nonachlor	0.852	P	ug/kg	0.652	0.652	1	A
4,4'-DDE	4.93		ug/kg	0.652	0.652	1	A
Dieldrin	1.81	IP	ug/kg	0.652	0.652	1	A
Endrin	ND		ug/kg	0.652	0.652	1	A
Endosulfan II	ND		ug/kg	0.652	0.652	1	A
4,4'-DDD	1.50		ug/kg	0.652	0.652	1	A
cis-Nonachlor	ND		ug/kg	0.652	0.652	1	A
4,4'-DDT	1.73	IP	ug/kg	0.652	0.652	1	A
Methoxychlor	3.66	P	ug/kg	2.61	2.61	1	B
Toxaphene	ND		ug/kg	32.7	32.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	59		30-150	B
BZ 198	67		30-150	B
DBOB	72		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 11/13/18 19:20
Analyst: DP

Extraction Method: EPA 3570
Extraction Date: 10/28/18 11:09
Cleanup Method: EPA 3630
Cleanup Date: 10/29/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-18 Batch: WG1173137-1						
Hexachlorobenzene	ND		ug/kg	0.500	0.500	A
gamma-BHC	ND		ug/kg	0.250	0.250	A
Heptachlor	ND		ug/kg	0.250	0.250	A
Aldrin	ND		ug/kg	0.250	0.250	A
trans-Chlordane	ND		ug/kg	0.250	0.250	A
Endosulfan I	ND		ug/kg	0.250	0.250	A
cis-Chlordane	ND		ug/kg	0.250	0.250	A
trans-Nonachlor	ND		ug/kg	0.250	0.250	A
4,4'-DDE	ND		ug/kg	0.250	0.250	A
Dieldrin	ND		ug/kg	0.250	0.250	A
Endrin	ND		ug/kg	0.250	0.250	A
Endosulfan II	ND		ug/kg	0.250	0.250	A
4,4'-DDD	ND		ug/kg	0.250	0.250	A
cis-Nonachlor	ND		ug/kg	0.250	0.250	A
4,4'-DDT	ND		ug/kg	0.250	0.250	A
Methoxychlor	ND		ug/kg	1.00	1.00	A
Toxaphene	ND		ug/kg	12.6	12.6	A
Heptachlor epoxide	ND		ug/kg	0.500	0.500	B
Oxychlordane	ND		ug/kg	0.500	0.500	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	44		30-150	B
BZ 198	42		30-150	B
DBOB	44		30-150	A
BZ 198	39		30-150	A



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1173137-2 WG1173137-3									
Hexachlorobenzene	69		73		50-120	6		30	A
gamma-BHC	66		69		50-120	4		30	A
Heptachlor	71		75		50-120	5		30	A
Aldrin	73		78		50-120	7		30	A
trans-Chlordane	82		87		50-120	6		30	A
Endosulfan I	80		85		50-120	6		30	A
cis-Chlordane	79		84		50-120	6		30	A
trans-Nonachlor	74		79		50-120	7		30	A
4,4'-DDE	92		98		50-120	6		30	A
Dieldrin	88		94		50-120	7		30	A
Endrin	81		85		50-120	5		30	A
4,4'-DDD	85		90		50-120	6		30	A
cis-Nonachlor	83		88		50-120	6		30	A
4,4'-DDT	81		86		50-120	6		30	A
Methoxychlor	75		78		50-120	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	69		71		30-150	B
BZ 198	74		75		30-150	B
DBOB	70		74		30-150	A
BZ 198	76		72		30-150	A



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 Batch: WG1173137-2 WG1173137-3									
Heptachlor epoxide	74		74		50-120	0		30	B
Oxychlorane	75		75		50-120	0		30	B
Endosulfan II	75		78		50-120	4		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	69		71		30-150	B
BZ 198	74		75		30-150	B
DBOB	70		74		30-150	A
BZ 198	76		72		30-150	A



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab US-1 0-5.5 Associated sample(s): 01-18 QC Batch ID: WG1173137-6 WG1173137-7 QC Sample: L1843305-07 Client ID:													
Hexachlorobenzene	ND	129	87.2	68		112	87		50-120	25		30	A
gamma-BHC	0.998	129	82.7	63		103	79		50-120	22		30	B
Heptachlor	ND	129	90.3	70		117	91		50-120	26		30	A
Aldrin	ND	129	99.7	77		130	101		50-120	26		30	A
Heptachlor epoxide	ND	129	84.2	65		104	81		50-120	21		30	B
Oxychlordane	5.85	129	90.0	65		112	83		50-120	22		30	B
trans-Chlordane	17.6	129	116	76		149	102		50-120	25		30	A
Endosulfan I	ND	129	101	78		130	101		50-120	25		30	A
cis-Chlordane	1.38	129	97.9	75		125	96		50-120	24		30	A
trans-Nonachlor	1.86	129	92.8	70		118	90		50-120	24		30	A
4,4'-DDE	3.77	129	116	87		148	112		50-120	24		30	A
Dieldrin	1.25	129	110	84		142	110		50-120	25		30	A
Endrin	ND	129	105	81		132	103		50-120	23		30	A
Endosulfan II	3.97	129	153	115		190	145	Q	50-120	22		30	A
4,4'-DDD	1.56	129	116	89		145	112		50-120	22		30	A
cis-Nonachlor	0.687	129	102	79		128	99		50-120	23		30	A
4,4'-DDT	3.42	129	142	107		166	127	Q	50-120	16		30	B
Methoxychlor	3.89	129	82.0	61		80.1	59		50-120	2		30	B

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
BZ 198	67		79		30-150	B
DBOB	60		74		30-150	B



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1173137-6 WG1173137-7 QC Sample: L1843305-07 Client ID: US-1 0-5.5

Surrogate	MS		MSD		Acceptance Criteria	Column
	% Recovery	Qualifier	% Recovery	Qualifier		
BZ 198	70		86		30-150	A
DBOB	72		89		30-150	A



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 5.0

Lab Number: L1843305

Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1173137-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Hexachlorobenzene	ND	ND	ug/kg	NC		30 A
gamma-BHC	0.998	1.01P	ug/kg	1		30 B
Heptachlor	ND	ND	ug/kg	NC		30 A
Aldrin	ND	ND	ug/kg	NC		30 A
Heptachlor epoxide	ND	ND	ug/kg	NC		30 B
Oxychlordane	5.85	6.28	ug/kg	7		30 B
trans-Chlordane	17.6	15.7P	ug/kg	11		30 A
Endosulfan I	ND	ND	ug/kg	NC		30 A
cis-Chlordane	1.38	1.15P	ug/kg	18		30 A
trans-Nonachlor	1.86	1.79P	ug/kg	4		30 A
4,4'-DDE	3.77	3.60P	ug/kg	5		30 A
Dieldrin	1.25	1.18IP	ug/kg	6		30 A
Endrin	ND	ND	ug/kg	NC		30 A
Endosulfan II	3.97	3.47P	ug/kg	13		30 A
4,4'-DDD	1.56	1.38	ug/kg	12		30 A
cis-Nonachlor	0.687	ND	ug/kg	NC		30 A
4,4'-DDT	3.42	3.27	ug/kg	4		30 B
Methoxychlor	3.89	3.31	ug/kg	16		30 B
Toxaphene	ND	ND	ug/kg	NC		30 A

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 5.0

Lab Number: L1843305

Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1173137-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		63		30-150	B
BZ 198	76		76		30-150	B
DBOB	85		87		30-150	A
BZ 198	79		74		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1173137-4

Parameter	% Recovery	Qual	QC Criteria
Hexachlorobenzene	56		40-140
cis-Chlordane	79		40-140
trans-Nonachlor	486	Q	40-140
DBOB (Surrogate)	50		30-150
DBOB (Surrogate)	57		30-150
BZ 198 (Surrogate)	46		30-150
BZ 198 (Surrogate)	58		30-150

METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-01

Date Collected: 10/22/18 16:50

Client ID: TB-2

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 37%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.42		mg/kg	1.34	0.177	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Cadmium, Total	0.597		mg/kg	0.536	0.071	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Chromium, Total	67.8		mg/kg	5.36	1.25	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Copper, Total	89.7		mg/kg	5.36	0.520	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Lead, Total	53.8		mg/kg	1.61	0.391	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Mercury, Total	0.210		mg/kg	0.028	0.004	5	11/13/18 19:35	11/18/18 15:32	EPA 7474	1,7474	BV
Nickel, Total	25.0		mg/kg	2.68	0.716	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM
Zinc, Total	173		mg/kg	26.8	6.96	10	11/13/18 19:00	11/14/18 12:57	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-02

Date Collected: 10/22/18 17:15

Client ID: US-2 0.0-5.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 42%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.43		mg/kg	1.18	0.156	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Cadmium, Total	2.48		mg/kg	0.471	0.062	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Chromium, Total	117		mg/kg	4.71	1.10	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Copper, Total	178		mg/kg	4.71	0.457	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Lead, Total	100		mg/kg	1.41	0.344	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Mercury, Total	0.418		mg/kg	0.025	0.003	5	11/13/18 19:35	11/18/18 15:35	EPA 7474	1,7474	BV
Nickel, Total	31.7		mg/kg	2.36	0.630	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM
Zinc, Total	263		mg/kg	23.6	6.13	10	11/13/18 19:00	11/14/18 13:01	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-03

Date Collected: 10/22/18 15:17

Client ID: US-2 5.0-6.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 75%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.31		mg/kg	0.668	0.088	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Cadmium, Total	ND		mg/kg	0.267	0.035	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Chromium, Total	6.16		mg/kg	2.67	0.625	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Copper, Total	5.20		mg/kg	2.67	0.259	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Lead, Total	5.30		mg/kg	0.801	0.195	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Mercury, Total	ND		mg/kg	0.014	0.002	5	11/13/18 19:35	11/18/18 15:37	EPA 7474	1,7474	BV
Nickel, Total	4.16		mg/kg	1.34	0.357	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM
Zinc, Total	11.5	J	mg/kg	13.4	3.47	10	11/13/18 19:00	11/14/18 13:05	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-04

Date Collected: 10/23/18 10:25

Client ID: TB-1 0-5.2

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 38%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	8.12		mg/kg	1.30	0.171	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Cadmium, Total	0.618		mg/kg	0.518	0.068	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Chromium, Total	64.9		mg/kg	5.18	1.21	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Copper, Total	86.7		mg/kg	5.18	0.503	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Lead, Total	49.8		mg/kg	1.56	0.378	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Mercury, Total	0.219		mg/kg	0.028	0.004	5	11/13/18 19:35	11/18/18 15:45	EPA 7474	1,7474	BV
Nickel, Total	23.6		mg/kg	2.59	0.692	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM
Zinc, Total	165		mg/kg	25.9	6.74	10	11/13/18 19:00	11/14/18 13:09	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-05

Date Collected: 10/23/18 10:30

Client ID: TB-1 5.2-6.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.64		mg/kg	0.670	0.089	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Cadmium, Total	0.068	J	mg/kg	0.268	0.035	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Chromium, Total	9.69		mg/kg	2.68	0.628	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Copper, Total	11.9		mg/kg	2.68	0.260	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Lead, Total	8.40		mg/kg	0.804	0.196	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Mercury, Total	0.016		mg/kg	0.014	0.002	5	11/13/18 19:35	11/18/18 15:47	EPA 7474	1,7474	BV
Nickel, Total	5.58		mg/kg	1.34	0.358	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM
Zinc, Total	21.4		mg/kg	13.4	3.49	10	11/13/18 19:00	11/14/18 13:51	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-06

Date Collected: 10/23/18 11:10

Client ID: CAD-3 0-5.5

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 46%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.33		mg/kg	1.06	0.140	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Cadmium, Total	0.568		mg/kg	0.425	0.056	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Chromium, Total	51.2		mg/kg	4.25	0.996	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Copper, Total	103		mg/kg	4.25	0.413	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Lead, Total	56.4		mg/kg	1.28	0.310	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Mercury, Total	0.784		mg/kg	0.023	0.003	5	11/13/18 19:35	11/18/18 15:50	EPA 7474	1,7474	BV
Nickel, Total	20.0		mg/kg	2.13	0.568	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM
Zinc, Total	159		mg/kg	21.3	5.53	10	11/13/18 19:00	11/14/18 13:55	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-07

Date Collected: 10/23/18 12:24

Client ID: US-1 0-5.5

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 36%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.3		mg/kg	1.30	0.172	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Cadmium, Total	1.00		mg/kg	0.521	0.069	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Chromium, Total	85.2		mg/kg	5.21	1.22	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Copper, Total	129		mg/kg	5.21	0.505	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Lead, Total	77.9		mg/kg	1.56	0.380	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Mercury, Total	0.299		mg/kg	0.029	0.004	5	11/13/18 19:35	11/18/18 14:17	EPA 7474	1,7474	BV
Nickel, Total	30.2		mg/kg	2.60	0.696	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM
Zinc, Total	216		mg/kg	26.0	6.77	10	11/13/18 19:00	11/14/18 12:41	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-08

Date Collected: 10/23/18 13:10

Client ID: CAD-2 0.5.3

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 44%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.3		mg/kg	1.13	0.149	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Cadmium, Total	0.574		mg/kg	0.452	0.060	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Chromium, Total	45.5		mg/kg	4.52	1.06	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Copper, Total	75.6		mg/kg	4.52	0.439	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Lead, Total	48.8		mg/kg	1.36	0.330	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Mercury, Total	0.667		mg/kg	0.024	0.003	5	11/13/18 19:35	11/18/18 15:52	EPA 7474	1,7474	BV
Nickel, Total	19.8		mg/kg	2.26	0.605	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM
Zinc, Total	142		mg/kg	22.6	5.88	10	11/13/18 19:00	11/14/18 13:59	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-09

Date Collected: 10/23/18 14:20

Client ID: CAD-2 5.3-10.8

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 50%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.38		mg/kg	0.965	0.127	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Cadmium, Total	0.133	J	mg/kg	0.386	0.051	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Chromium, Total	26.6		mg/kg	3.86	0.903	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Copper, Total	8.63		mg/kg	3.86	0.374	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Lead, Total	7.78		mg/kg	1.16	0.282	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Mercury, Total	ND		mg/kg	0.021	0.003	5	11/13/18 19:35	11/18/18 15:55	EPA 7474	1,7474	BV
Nickel, Total	16.4		mg/kg	1.93	0.516	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM
Zinc, Total	48.4		mg/kg	19.3	5.02	10	11/13/18 19:00	11/14/18 14:17	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-10

Date Collected: 10/23/18 12:10

Client ID: W1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 39%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	8.24		mg/kg	1.22	0.161	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Cadmium, Total	2.74		mg/kg	0.487	0.064	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Chromium, Total	110		mg/kg	4.87	1.14	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Copper, Total	189		mg/kg	4.87	0.472	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Lead, Total	109		mg/kg	1.46	0.355	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Mercury, Total	0.490		mg/kg	0.027	0.003	5	11/13/18 19:35	11/18/18 15:57	EPA 7474	1,7474	BV
Nickel, Total	31.4		mg/kg	2.43	0.650	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM
Zinc, Total	256		mg/kg	24.3	6.33	10	11/13/18 19:00	11/14/18 14:21	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-11

Date Collected: 10/23/18 11:31

Client ID: V1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 32%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.4		mg/kg	1.50	0.198	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Cadmium, Total	0.545	J	mg/kg	0.601	0.079	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Chromium, Total	67.8		mg/kg	6.01	1.41	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Copper, Total	86.2		mg/kg	6.01	0.583	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Lead, Total	55.4		mg/kg	1.80	0.439	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Mercury, Total	0.191		mg/kg	0.032	0.004	5	11/13/18 19:35	11/18/18 16:00	EPA 7474	1,7474	BV
Nickel, Total	27.1		mg/kg	3.01	0.803	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM
Zinc, Total	173		mg/kg	30.1	7.82	10	11/13/18 19:00	11/14/18 14:25	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-12

Date Collected: 10/23/18 12:25

Client ID: S1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 41%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.85		mg/kg	1.17	0.154	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Cadmium, Total	1.46		mg/kg	0.467	0.062	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Chromium, Total	94.4		mg/kg	4.67	1.09	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Copper, Total	132		mg/kg	4.67	0.453	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Lead, Total	79.5		mg/kg	1.40	0.341	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Mercury, Total	0.383		mg/kg	0.025	0.003	5	11/13/18 19:35	11/18/18 16:08	EPA 7474	1,7474	BV
Nickel, Total	28.8		mg/kg	2.33	0.624	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM
Zinc, Total	214		mg/kg	23.3	6.07	10	11/13/18 19:00	11/14/18 14:30	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-13

Date Collected: 10/23/18 12:39

Client ID: R1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 41%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.50		mg/kg	1.17	0.154	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Cadmium, Total	1.42		mg/kg	0.467	0.062	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Chromium, Total	97.9		mg/kg	4.67	1.09	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Copper, Total	144		mg/kg	4.67	0.453	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Lead, Total	85.0		mg/kg	1.40	0.341	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Mercury, Total	0.367		mg/kg	0.026	0.003	5	11/13/18 19:35	11/18/18 16:10	EPA 7474	1,7474	BV
Nickel, Total	31.7		mg/kg	2.33	0.623	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM
Zinc, Total	226		mg/kg	23.3	6.07	10	11/13/18 19:00	11/14/18 14:34	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-14

Date Collected: 10/23/18 15:00

Client ID: CAD-3 6.1-9.9

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 55%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.29		mg/kg	0.884	0.117	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Cadmium, Total	0.141	J	mg/kg	0.354	0.047	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Chromium, Total	25.5		mg/kg	3.54	0.828	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Copper, Total	10.5		mg/kg	3.54	0.343	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Lead, Total	9.49		mg/kg	1.06	0.258	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Mercury, Total	0.015	J	mg/kg	0.019	0.002	5	11/13/18 19:35	11/18/18 16:13	EPA 7474	1,7474	BV
Nickel, Total	16.4		mg/kg	1.77	0.472	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM
Zinc, Total	44.3		mg/kg	17.7	4.60	10	11/13/18 19:00	11/14/18 14:38	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-15

Date Collected: 10/23/18 16:34

Client ID: CAD-1 0-4.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 43%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.64		mg/kg	1.14	0.151	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Cadmium, Total	1.01		mg/kg	0.457	0.060	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Chromium, Total	74.2		mg/kg	4.57	1.07	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Copper, Total	139		mg/kg	4.57	0.443	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Lead, Total	70.6		mg/kg	1.37	0.334	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Mercury, Total	0.699		mg/kg	0.025	0.003	5	11/13/18 19:35	11/18/18 16:15	EPA 7474	1,7474	BV
Nickel, Total	23.3		mg/kg	2.28	0.611	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM
Zinc, Total	210		mg/kg	22.8	5.94	10	11/13/18 19:00	11/14/18 14:42	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-16

Date Collected: 10/23/18 16:30

Client ID: CAD-1 4.4-9.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 51%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.20		mg/kg	0.948	0.125	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Cadmium, Total	0.163	J	mg/kg	0.379	0.050	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Chromium, Total	27.4		mg/kg	3.79	0.887	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Copper, Total	10.5		mg/kg	3.79	0.368	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Lead, Total	8.92		mg/kg	1.14	0.277	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.021	0.003	5	11/13/18 19:35	11/18/18 16:18	EPA 7474	1,7474	BV
Nickel, Total	16.5		mg/kg	1.90	0.506	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM
Zinc, Total	48.9		mg/kg	19.0	4.93	10	11/13/18 19:00	11/14/18 14:46	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-17

Date Collected: 10/23/18 16:15

Client ID: DS-1 0-7.3

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 37%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.97		mg/kg	1.29	0.170	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Cadmium, Total	1.53		mg/kg	0.516	0.068	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Chromium, Total	102		mg/kg	5.16	1.21	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Copper, Total	135		mg/kg	5.16	0.501	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Lead, Total	75.7		mg/kg	1.55	0.377	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Mercury, Total	0.382		mg/kg	0.028	0.004	5	11/13/18 19:35	11/18/18 16:20	EPA 7474	1,7474	BV
Nickel, Total	28.8		mg/kg	2.58	0.690	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM
Zinc, Total	224		mg/kg	25.8	6.71	10	11/13/18 19:00	11/14/18 14:50	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-18

Date Collected: 10/23/18 17:35

Client ID: DS-2 0-7.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 38%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.00		mg/kg	1.31	0.172	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Cadmium, Total	1.77		mg/kg	0.523	0.069	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Chromium, Total	105		mg/kg	5.23	1.22	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Copper, Total	134		mg/kg	5.23	0.507	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Lead, Total	69.5		mg/kg	1.57	0.382	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Mercury, Total	0.433		mg/kg	0.028	0.004	5	11/13/18 19:35	11/18/18 16:23	EPA 7474	1,7474	BV
Nickel, Total	28.0		mg/kg	2.61	0.698	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM
Zinc, Total	235		mg/kg	26.1	6.80	10	11/13/18 19:00	11/14/18 14:54	EPA 3050B	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1178831-1									
Arsenic, Total	ND	mg/kg	0.500	0.066	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Cadmium, Total	ND	mg/kg	0.200	0.026	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Chromium, Total	ND	mg/kg	2.00	0.468	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Copper, Total	ND	mg/kg	2.00	0.194	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Lead, Total	ND	mg/kg	0.600	0.146	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Nickel, Total	ND	mg/kg	1.00	0.267	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM
Zinc, Total	ND	mg/kg	10.0	2.60	10	11/13/18 19:00	11/14/18 11:46	1,6020B	AM

Prep Information

Digestion Method: EPA 3050B

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-18 Batch: WG1179091-1									
Mercury, Total	ND	mg/kg	0.013	0.002	5	11/13/18 19:35	11/18/18 14:12	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1178831-2 SRM Lot Number: D102-540								
Arsenic, Total	87		-		83-117	-		20
Cadmium, Total	99		-		83-118	-		20
Chromium, Total	85		-		83-117	-		20
Copper, Total	84		-		84-116	-		20
Lead, Total	85		-		82-118	-		20
Nickel, Total	88		-		83-117	-		20
Zinc, Total	83		-		81-118	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 Batch: WG1179091-2 SRM Lot Number: D102-540								
Mercury, Total	96		-		65-134	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Lab Number: L1843305
Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1178831-3 WG1178831-4 QC Sample: L1843305-07 Client ID: US-1 0-5.5												
Arsenic, Total	10.3	25.4	33.9	93		34.4	93		75-125	1		20
Cadmium, Total	1.00	10.8	12.2	104		12.7	106		75-125	4		20
Chromium, Total	85.2	42.3	117	75		120	81		75-125	3		20
Copper, Total	129.	52.8	166	70	Q	164	65	Q	75-125	1		20
Lead, Total	77.9	108	178	93		192	104		75-125	8		20
Nickel, Total	30.2	106	123	88		130	93		75-125	6		20
Zinc, Total	216.	106	292	72	Q	293	72	Q	75-125	0		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1179091-3 WG1179091-4 QC Sample: L1843305-07 Client ID: US-1 0-5.5												
Mercury, Total	0.299	1.44	1.73	99		1.64	92		80-120	5		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 5.0

Lab Number: L1843305

Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1178831-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Arsenic, Total	10.3	9.61	mg/kg	7		20
Cadmium, Total	1.00	0.980	mg/kg	2		20
Chromium, Total	85.2	76.7	mg/kg	11		20
Copper, Total	129.	117	mg/kg	10		20
Lead, Total	77.9	65.4	mg/kg	17		20
Nickel, Total	30.2	27.3	mg/kg	10		20
Zinc, Total	216.	197	mg/kg	9		20
Total Metals - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1179091-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Mercury, Total	0.299	0.279	mg/kg	7		20

INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-01

Date Collected: 10/22/18 16:50

Client ID: TB-2

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.67		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.74		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	36.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	63.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-02

Date Collected: 10/22/18 17:15

Client ID: US-2 0.0-5.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.88		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.93		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	42.0		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	58.0		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-03

Date Collected: 10/22/18 15:17

Client ID: US-2 5.0-6.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.016		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	0.017		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	74.9		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	25.1		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-04

Date Collected: 10/23/18 10:25

Client ID: TB-1 0-5.2

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.55		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.46		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	37.5		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	62.5		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-05

Date Collected: 10/23/18 10:30

Client ID: TB-1 5.2-6.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.069		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	0.073		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	73.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	26.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-06

Date Collected: 10/23/18 11:10

Client ID: CAD-3 0-5.5

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.15		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	1.91		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	45.8		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	54.2		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-07

Date Collected: 10/23/18 12:24

Client ID: US-1 0-5.5

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	3.32		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	3.42		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	36.3		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	63.7		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-08

Date Collected: 10/23/18 13:10

Client ID: CAD-2 0.5.3

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.14		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.03		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	43.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	56.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-09

Date Collected: 10/23/18 14:20

Client ID: CAD-2 5.3-10.8

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.38		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	1.28		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	50.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	49.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-10

Date Collected: 10/23/18 12:10

Client ID: W1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.99		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	3.14		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	38.9		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	61.1		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-11

Date Collected: 10/23/18 11:31

Client ID: V1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.96		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.88		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	32.1		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	67.9		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-12

Date Collected: 10/23/18 12:25

Client ID: S1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.52		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.46		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	41.2		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	58.8		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-13

Date Collected: 10/23/18 12:39

Client ID: R1

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.88		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.87		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	40.8		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	59.2		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-14

Date Collected: 10/23/18 15:00

Client ID: CAD-3 6.1-9.9

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.56		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	1.64		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	55.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	44.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-15

Date Collected: 10/23/18 16:34

Client ID: CAD-1 0-4.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.26		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.14		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	42.7		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	57.3		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-16

Date Collected: 10/23/18 16:30

Client ID: CAD-1 4.4-9.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.31		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	1.23		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	50.7		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	49.3		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-17

Date Collected: 10/23/18 16:15

Client ID: DS-1 0-7.3

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.49		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	2.56		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	37.4		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	62.6		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19**SAMPLE RESULTS**

Lab ID: L1843305-18

Date Collected: 10/23/18 17:35

Client ID: DS-2 0-7.0

Date Received: 10/24/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.82		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	3.22		%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	37.5		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD
Moisture	62.5		%	0.100	0.100	1	-	10/25/18 14:47	121,2540G	GD



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab for sample(s): 01-18 Batch: WG1178455-1									
Total Organic Carbon (Rep1)	ND	%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP
Total Organic Carbon (Rep2)	ND	%	0.010	0.010	1	-	11/06/18 00:00	1,9060A	SP

Lab Control Sample Analysis**Batch Quality Control****Project Name:** NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1843305**Project Number:** 60588790 TASK 5.0**Report Date:** 04/05/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-18 Batch: WG1178455-2								
Total Organic Carbon (Rep1)	101		-		75-125	-		25
Total Organic Carbon (Rep2)	86		-		75-125	-		25

Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1843305

Project Number: 60588790 TASK 5.0

Report Date: 04/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1178455-4 WG1178455-5 QC Sample: L1843305-07 Client ID: US-1 0-5.5												
Total Organic Carbon (Rep1)	3.32	1.34	4.74	106		4.47	106		75-125	6		25
Total Organic Carbon (Rep2)	3.42	1.37	4.72	95		4.63	93		75-125	2		25

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 5.0

Lab Number: L1843305

Report Date: 04/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1172177-1 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Solids, Total	36.3	35.4	%	3		10
Moisture	63.7	64.6	%	1		10
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-18 QC Batch ID: WG1178455-3 QC Sample: L1843305-07 Client ID: US-1 0-5.5						
Total Organic Carbon (Rep1)	3.32	3.40	%	2		25
Total Organic Carbon (Rep2)	3.42	3.39	%	1		25

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Serial_No:04051915:05
Lab Number: L1843305
Report Date: 04/05/19

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843305-01A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-02A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-03A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-04A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

*Values in parentheses indicate holding time in days



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Serial_No:04051915:05
Lab Number: L1843305
Report Date: 04/05/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843305-05A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-06A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-07A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-07B	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-07C	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Serial_No:04051915:05
Lab Number: L1843305
Report Date: 04/05/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843305-08A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-09A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-10A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-11A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-12A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 5.0

Serial_No:04051915:05
Lab Number: L1843305
Report Date: 04/05/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843305-13A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-14A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-15A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-16A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1843305-17A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1843305-18A	Glass 250ml/8oz unpreserved	A	NA		2.4	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-HGPREP-AF(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers



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- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Report Format: DU Report with 'J' Qualifiers



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REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	No, see narrative
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	No, see narrative
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No, see narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No, see narrative
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes



Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	



Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	Trans-Nonachlor @486%	In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	No	L1843305-07MSD: 4.4'-DDT @ 127%, endosulfan II @ 145%	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	Cl5-BZ#101 (42%), Cl5-BZ#118 (46%), Cl6-BZ#138 (51%) and Cl6-BZ#153 (45%)	In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	N/A		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	No	WG1178831-3 MS Cu (70%), Zn(72%); WG1178831-4 MSD Cu (65%), Zn(72%)	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.



CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 10/24/18

ALPHA Job #: L1843305

8 Wakeup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: **NEW HAVEN HBR**

Project Location: **NEW HAVEN, CT**

Project #: _____

Project Manager: **RICHARD LOYD / KRIS JANNARSON**

ALPHA Quote #: _____

Report Information - Data Deliverables

ADEx EMAIL

Billing Information

Same as Client info PO #: _____

Client Information

Client: **USACE / AECOM**

Address: **696 VIRGINIARD CONCORD, MA 01742**

Phone: **978-318-8048**

Email: **RICHARD.B.LOYD@USACE.ARMY.MIL**

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due: _____

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program **REM** Criteria **REM**

Additional Project Information:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 924.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	EPH: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> PCB <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	REM METALS	PAHS	PCBS	PESTICIDES	TOC	%MST / IS	SAMPLE INFO	TOTAL # BOTTLES
		Date	Time																		
43305-01	TB-2	10/22	16:50	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
02	US-2 00-5.0	10/22	17:20	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
03	US-2 5.0-6.0	10/22	17:20	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
04	TB-1 0-5.2	10/23	10:25	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
05	TB-1 5.2-6.0	10/23	10:25	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
06	CAD-3 0-5.5	10/23	11:43	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
07	US-1 0-5.5	10/23	12:34	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
08	CAD-2 0.5.3	10/23	13:47	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
09	CAD-2 5.3-10.8	10/23	14:15	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
10	WIP	10/23	13:10	SE	RSL	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₃
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type: **AAAAAA**
Preservative: **AAAAAA**

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Richard Bi Lloyd</i>	10/23 18:00	<i>Cheryl...</i>	10/23 18:00
<i>Cheryl...</i>	10/24 13:25	<i>...</i>	10/24 11:33
<i>...</i>	10/24/18 15:09	<i>...</i>	10/24/18 15:09

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)



CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 10/24/18 ALPHA Job #: 1843208

8 Walkup Drive Westboro, MA 01581 Tel: 508-898-9220
 320 Forbes Blvd Mansfield, MA 02048 Tel: 508-822-9300

Project Information

Project Name: NEW HAVEN HBR
 Project Location: NEW HAVEN-CT
 Project #: 1
 Project Manager: RICHARD LOYD
KRIS VAN NAARDEN
 ALPHA Quote #:

Report Information - Data Deliverables

ADEx EMAIL
 Same as Client info PO #:

Client Information

Client: USACE / AECOM
 Address: 696 VIRGINIA RD
CONCORD, MA 01742
 Phone: 978-318-8048
 Email: RICHARD.B.LOYD@USACE.ARMY.MIL

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)
 Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program RPM Criteria RPM

Additional Project Information:

ANALYSIS	VOC: <input type="checkbox"/> 8280 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15	METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPI3	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	PCB <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	<u>RPM METALS</u>	<u>PAH S</u>	<u>PCBS</u>	<u>PESTICIDES</u>	<u>TOC</u>	<u>% MS/MSD</u>	<u>ITS</u>
----------	--	---	---	---	---	---	-----------------------------------	---	-------------------	--------------	-------------	-------------------	------------	-----------------	------------

SAMPLE INFO
 Filtration Field Lab to do
 Preservation Lab to do

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Fingerprint	RPM METALS	PAH S	PCBS	PESTICIDES	TOC	% MS/MSD	ITS	SAMPLE INFO	Preservation	Filtration	Lab to do	Lab to do	TOTAL # BOTTLES	
		Date	Time																									
13305-11	SI																											
12	V1	10/23	11:31	SE	RBL	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1	
13	S1	10/23	12:05	SE	RBL	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
14	R1	10/23	12:31	SE	RBL	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
15	CAD-3 6.1-9.9	10/23	15:00	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
16	CAD-1 0-4.0	10/23	15:58	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
17	CAD-1 4.4-9.0	10/23	16:30	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
18	DS-1 0-7.3	10/23	17:00	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
07	DS-2 0-7.0	10/23	17:38	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1		
	DUP /MS/MSD	10/23	13:10	SE	GJS	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	2		

Container Type
 P= Plastic
 A= Amber glass
 V= Vial
 G= Glass
 B= Bacteria cup
 C= Cube
 O= Other
 E= Encore
 D= BOD Bottle

Preservative
 A= None
 B= HCl
 C= HNO3
 D= H2SO4
 E= NaOH
 F= MeOH
 G= NaHSO4
 H= Na2S2O8
 I= Ascorbic Acid
 J= NH4Cl
 K= Zn Acetate
 O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Richard B. Loyd</u>	10/23 18:00	<u>Chad [Signature]</u>	10/23 18:00
<u>Chad [Signature]</u>	10/24 13:25	<u>[Signature]</u>	10/24 13:25
<u>[Signature]</u>	10/24 18:00	<u>[Signature]</u>	10/24 18:00

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
 FORM NO: 01-01 (rev. 12-Mar-2012)

Appendix C.3: Tissue Chemistry Lab Report

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

February 5, 2019

28-Day Bioassay Preliminary Tissue Reports

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

28-Day Bioassay Preliminary Tissue Report

- ***Macoma nasuta* Data**



ANALYTICAL REPORT

Lab Number:	L1853052
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 10.0
Report Date:	01/24/19

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1853052-01	B567PREMNA	MACOMA	NEW HAVEN, CT	12/21/18 10:15	12/26/18
L1853052-02	B567PREMNB	MACOMA	NEW HAVEN, CT	12/21/18 10:15	12/26/18
L1853052-03	B567PREMNC	MACOMA	NEW HAVEN, CT	12/21/18 10:15	12/26/18
L1853052-04	B567PREMND	MACOMA	NEW HAVEN, CT	12/21/18 10:15	12/26/18
L1853052-05	B567PREMNE	MACOMA	NEW HAVEN, CT	12/21/18 10:15	12/26/18
L1853052-06	B567LABMNA	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-07	B567LABMNB	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-08	B567LABMNC	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-09	B567LABMND	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-10	B567LABMNE	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-11	B567R01MNA	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-12	B567R01MNB	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-13	B567R01MNC	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-14	B567R01MND	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-15	B567R01MNE	MACOMA	NEW HAVEN, CT	12/21/18 09:30	12/26/18
L1853052-16	B567S01MNA	MACOMA	NEW HAVEN, CT	12/21/18 10:30	12/26/18
L1853052-17	B567S01MNB	MACOMA	NEW HAVEN, CT	12/21/18 10:30	12/26/18
L1853052-18	B567S01MNC	MACOMA	NEW HAVEN, CT	12/21/18 10:30	12/26/18
L1853052-19	B567S01MND	MACOMA	NEW HAVEN, CT	12/21/18 10:30	12/26/18
L1853052-20	B567S01MNE	MACOMA	NEW HAVEN, CT	12/21/18 10:30	12/26/18
L1853052-21	B567S02MNA	MACOMA	NEW HAVEN, CT	12/21/18 10:45	12/26/18
L1853052-22	B567S02MNB	MACOMA	NEW HAVEN, CT	12/21/18 10:45	12/26/18
L1853052-23	B567S02MNC	MACOMA	NEW HAVEN, CT	12/21/18 10:45	12/26/18
L1853052-24	B567S02MND	MACOMA	NEW HAVEN, CT	12/21/18 10:45	12/26/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1853052-25	B567S02MNE	MACOMA	NEW HAVEN, CT	12/21/18 10:45	12/26/18
L1853052-26	B567S03MNA	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-27	B567S03MNB	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-28	B567S03MNC	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-29	B567S03MND	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-30	B567S03MNE	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-31	B567S04MNA	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-32	B567S04MNB	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-33	B567S04MNC	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-34	B567S04MND	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-35	B567S04MNE	MACOMA	NEW HAVEN, CT	12/21/18 11:15	12/26/18
L1853052-36	B567S05MNA	MACOMA	NEW HAVEN, CT	12/21/18 12:30	12/26/18
L1853052-37	B567S05MNB	MACOMA	NEW HAVEN, CT	12/21/18 12:30	12/26/18
L1853052-38	B567S05MNC	MACOMA	NEW HAVEN, CT	12/21/18 12:30	12/26/18
L1853052-39	B567S05MND	MACOMA	NEW HAVEN, CT	12/21/18 12:30	12/26/18
L1853052-40	B567S05MNE	MACOMA	NEW HAVEN, CT	12/21/18 12:30	12/26/18

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Case Narrative (continued)

eportaReport Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

The samples were received at the laboratory below the required temperature range. The samples were transported to the laboratory in a cooler with ice and were noted to be frozen.

Semivolatile Organics

PCB Congeners did not achieve the requested regulatory limits due to the current lab RL, however results were reported to the MDL.

The WG1194647-5 Laboratory Duplicate RPD for Cl3-BZ#18 (43%), performed on L1853052-22, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

Pesticides

Methoxychlor did not achieve the requested regulatory limits due to the current lab RL, however results were reported to the MDL.

Total Metals

The WG1194805-8 SRM recoveries, associated with L1853052-01, -02, -03, -11, -12, -13, -14, -15, -16, -17, -18, -19, and -20, are above the acceptance criteria for arsenic (60%), cadmium (66%) and zinc (58%); however, the associated LCS recoveries are within criteria. No further action was taken.

The WG1194857-8 SRM recoveries, associated with L1853052-21-40, are outside the acceptance criteria for arsenic (60%), cadmium (66%) and zinc (60%); however, the associated LCS recoveries are within criteria. No further action was taken.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

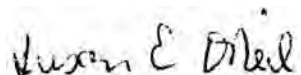
Case Narrative (continued)

Total Mercury

The WG1194808-2 LCS recovery, associated with L1853052-01, -02, -03, -11, -12, -13, -14, -15, -16, -17, -18, -19, and -20, is above the acceptance criteria for mercury (122%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 01/24/19

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-01
 Client ID: B567PREMNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 15:50
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.90	4.95	1
Acenaphthylene	ND		ug/kg	9.90	4.95	1
Acenaphthene	ND		ug/kg	9.90	4.95	1
Fluorene	ND		ug/kg	9.90	4.95	1
Phenanthrene	ND		ug/kg	9.90	4.95	1
Anthracene	ND		ug/kg	9.90	4.95	1
Fluoranthene	ND		ug/kg	9.90	4.95	1
Pyrene	ND		ug/kg	9.90	4.95	1
Benz(a)anthracene	ND		ug/kg	9.90	4.95	1
Chrysene	ND		ug/kg	9.90	4.95	1
Benzo(b)fluoranthene	ND		ug/kg	9.90	4.95	1
Benzo(k)fluoranthene	ND		ug/kg	9.90	4.95	1
Benzo(a)pyrene	ND		ug/kg	9.90	4.95	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.90	4.95	1
Dibenz(a,h)anthracene	ND		ug/kg	9.90	4.95	1
Benzo(ghi)perylene	ND		ug/kg	9.90	4.95	1
Cl2-BZ#8	ND		ug/kg	0.990	0.495	1
Cl3-BZ#18	ND		ug/kg	0.990	0.495	1
Cl3-BZ#28	ND		ug/kg	0.990	0.495	1
Cl4-BZ#44	ND		ug/kg	0.990	0.495	1
Cl4-BZ#49	ND		ug/kg	0.990	0.495	1
Cl4-BZ#52	ND		ug/kg	0.990	0.495	1
Cl4-BZ#66	ND		ug/kg	0.990	0.495	1
Cl5-BZ#87	ND		ug/kg	0.990	0.495	1
Cl5-BZ#101	ND		ug/kg	0.990	0.495	1
Cl5-BZ#105	ND		ug/kg	0.990	0.495	1
Cl5-BZ#118	ND		ug/kg	0.990	0.495	1
Cl6-BZ#128	ND		ug/kg	0.990	0.495	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-01
Client ID: B567PREMNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	ND		ug/kg	0.990	0.495	1
Cl6-BZ#153	ND		ug/kg	0.990	0.495	1
Cl7-BZ#170	ND		ug/kg	0.990	0.495	1
Cl7-BZ#180	ND		ug/kg	0.990	0.495	1
Cl7-BZ#183	ND		ug/kg	0.990	0.495	1
Cl7-BZ#184	ND		ug/kg	0.990	0.495	1
Cl7-BZ#187	ND		ug/kg	0.990	0.495	1
Cl8-BZ#195	ND		ug/kg	0.990	0.495	1
Cl9-BZ#206	ND		ug/kg	0.990	0.495	1
Cl10-BZ#209	ND		ug/kg	0.990	0.495	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	79		30-150
Pyrene-d10	91		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	101		30-150
BZ 198	82		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-02
 Client ID: B567PREMNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 17:29
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.38	4.69	1
Acenaphthylene	ND		ug/kg	9.38	4.69	1
Acenaphthene	ND		ug/kg	9.38	4.69	1
Fluorene	ND		ug/kg	9.38	4.69	1
Phenanthrene	ND		ug/kg	9.38	4.69	1
Anthracene	ND		ug/kg	9.38	4.69	1
Fluoranthene	5.70	J	ug/kg	9.38	4.69	1
Pyrene	5.02	J	ug/kg	9.38	4.69	1
Benz(a)anthracene	ND		ug/kg	9.38	4.69	1
Chrysene	ND		ug/kg	9.38	4.69	1
Benzo(b)fluoranthene	ND		ug/kg	9.38	4.69	1
Benzo(k)fluoranthene	ND		ug/kg	9.38	4.69	1
Benzo(a)pyrene	ND		ug/kg	9.38	4.69	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.38	4.69	1
Dibenz(a,h)anthracene	ND		ug/kg	9.38	4.69	1
Benzo(ghi)perylene	ND		ug/kg	9.38	4.69	1
Cl2-BZ#8	ND		ug/kg	0.938	0.469	1
Cl3-BZ#18	0.934	J	ug/kg	0.938	0.469	1
Cl3-BZ#28	ND		ug/kg	0.938	0.469	1
Cl4-BZ#44	ND		ug/kg	0.938	0.469	1
Cl4-BZ#49	ND		ug/kg	0.938	0.469	1
Cl4-BZ#52	ND		ug/kg	0.938	0.469	1
Cl4-BZ#66	ND		ug/kg	0.938	0.469	1
Cl5-BZ#87	ND		ug/kg	0.938	0.469	1
Cl5-BZ#101	ND		ug/kg	0.938	0.469	1
Cl5-BZ#105	ND		ug/kg	0.938	0.469	1
Cl5-BZ#118	ND		ug/kg	0.938	0.469	1
Cl6-BZ#128	ND		ug/kg	0.938	0.469	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-02
Client ID: B567PREMNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.938	0.469	1
CI6-BZ#153	ND		ug/kg	0.938	0.469	1
CI7-BZ#170	ND		ug/kg	0.938	0.469	1
CI7-BZ#180	ND		ug/kg	0.938	0.469	1
CI7-BZ#183	ND		ug/kg	0.938	0.469	1
CI7-BZ#184	0.489	J	ug/kg	0.938	0.469	1
CI7-BZ#187	ND		ug/kg	0.938	0.469	1
CI8-BZ#195	ND		ug/kg	0.938	0.469	1
CI9-BZ#206	ND		ug/kg	0.938	0.469	1
CI10-BZ#209	ND		ug/kg	0.938	0.469	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	87		30-150
Pyrene-d10	96		30-150
Benzo(b)fluoranthene-d12	90		30-150
DBOB	103		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-03
 Client ID: B567PREMNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 18:36
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.06	4.53	1
Acenaphthylene	ND		ug/kg	9.06	4.53	1
Acenaphthene	ND		ug/kg	9.06	4.53	1
Fluorene	ND		ug/kg	9.06	4.53	1
Phenanthrene	ND		ug/kg	9.06	4.53	1
Anthracene	ND		ug/kg	9.06	4.53	1
Fluoranthene	ND		ug/kg	9.06	4.53	1
Pyrene	ND		ug/kg	9.06	4.53	1
Benz(a)anthracene	ND		ug/kg	9.06	4.53	1
Chrysene	ND		ug/kg	9.06	4.53	1
Benzo(b)fluoranthene	ND		ug/kg	9.06	4.53	1
Benzo(k)fluoranthene	ND		ug/kg	9.06	4.53	1
Benzo(a)pyrene	ND		ug/kg	9.06	4.53	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.06	4.53	1
Dibenz(a,h)anthracene	ND		ug/kg	9.06	4.53	1
Benzo(ghi)perylene	ND		ug/kg	9.06	4.53	1
Cl2-BZ#8	ND		ug/kg	0.906	0.453	1
Cl3-BZ#18	ND		ug/kg	0.906	0.453	1
Cl3-BZ#28	ND		ug/kg	0.906	0.453	1
Cl4-BZ#44	ND		ug/kg	0.906	0.453	1
Cl4-BZ#49	ND		ug/kg	0.906	0.453	1
Cl4-BZ#52	ND		ug/kg	0.906	0.453	1
Cl4-BZ#66	ND		ug/kg	0.906	0.453	1
Cl5-BZ#87	ND		ug/kg	0.906	0.453	1
Cl5-BZ#101	ND		ug/kg	0.906	0.453	1
Cl5-BZ#105	ND		ug/kg	0.906	0.453	1
Cl5-BZ#118	ND		ug/kg	0.906	0.453	1
Cl6-BZ#128	ND		ug/kg	0.906	0.453	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-03
Client ID: B567PREMNC
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.906	0.453	1
CI6-BZ#153	ND		ug/kg	0.906	0.453	1
CI7-BZ#170	ND		ug/kg	0.906	0.453	1
CI7-BZ#180	ND		ug/kg	0.906	0.453	1
CI7-BZ#183	ND		ug/kg	0.906	0.453	1
CI7-BZ#184	ND		ug/kg	0.906	0.453	1
CI7-BZ#187	ND		ug/kg	0.906	0.453	1
CI8-BZ#195	ND		ug/kg	0.906	0.453	1
CI9-BZ#206	ND		ug/kg	0.906	0.453	1
CI10-BZ#209	ND		ug/kg	0.906	0.453	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	94		30-150
Pyrene-d10	97		30-150
Benzo(b)fluoranthene-d12	90		30-150
DBOB	106		30-150
BZ 198	82		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-11
 Client ID: B567R01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 19:09
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.75	4.87	1
Acenaphthylene	ND		ug/kg	9.75	4.87	1
Acenaphthene	ND		ug/kg	9.75	4.87	1
Fluorene	ND		ug/kg	9.75	4.87	1
Phenanthrene	5.34	J	ug/kg	9.75	4.87	1
Anthracene	ND		ug/kg	9.75	4.87	1
Fluoranthene	8.38	J	ug/kg	9.75	4.87	1
Pyrene	10.5		ug/kg	9.75	4.87	1
Benz(a)anthracene	5.16	J	ug/kg	9.75	4.87	1
Chrysene	ND		ug/kg	9.75	4.87	1
Benzo(b)fluoranthene	5.04	J	ug/kg	9.75	4.87	1
Benzo(k)fluoranthene	ND		ug/kg	9.75	4.87	1
Benzo(a)pyrene	ND		ug/kg	9.75	4.87	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.75	4.87	1
Dibenz(a,h)anthracene	ND		ug/kg	9.75	4.87	1
Benzo(ghi)perylene	ND		ug/kg	9.75	4.87	1
Cl2-BZ#8	ND		ug/kg	0.975	0.487	1
Cl3-BZ#18	ND		ug/kg	0.975	0.487	1
Cl3-BZ#28	ND		ug/kg	0.975	0.487	1
Cl4-BZ#44	ND		ug/kg	0.975	0.487	1
Cl4-BZ#49	ND		ug/kg	0.975	0.487	1
Cl4-BZ#52	ND		ug/kg	0.975	0.487	1
Cl4-BZ#66	ND		ug/kg	0.975	0.487	1
Cl5-BZ#87	ND		ug/kg	0.975	0.487	1
Cl5-BZ#101	ND		ug/kg	0.975	0.487	1
Cl5-BZ#105	ND		ug/kg	0.975	0.487	1
Cl5-BZ#118	ND		ug/kg	0.975	0.487	1
Cl6-BZ#128	ND		ug/kg	0.975	0.487	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-11
 Client ID: B567R01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	ND		ug/kg	0.975	0.487	1
Cl6-BZ#153	ND		ug/kg	0.975	0.487	1
Cl7-BZ#170	ND		ug/kg	0.975	0.487	1
Cl7-BZ#180	ND		ug/kg	0.975	0.487	1
Cl7-BZ#183	ND		ug/kg	0.975	0.487	1
Cl7-BZ#184	ND		ug/kg	0.975	0.487	1
Cl7-BZ#187	ND		ug/kg	0.975	0.487	1
Cl8-BZ#195	ND		ug/kg	0.975	0.487	1
Cl9-BZ#206	ND		ug/kg	0.975	0.487	1
Cl10-BZ#209	ND		ug/kg	0.975	0.487	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	85		30-150
Pyrene-d10	93		30-150
Benzo(b)fluoranthene-d12	87		30-150
DBOB	103		30-150
BZ 198	82		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-12
 Client ID: B567R01MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 19:42
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.56	4.78	1
Acenaphthylene	ND		ug/kg	9.56	4.78	1
Acenaphthene	ND		ug/kg	9.56	4.78	1
Fluorene	ND		ug/kg	9.56	4.78	1
Phenanthrene	5.41	J	ug/kg	9.56	4.78	1
Anthracene	ND		ug/kg	9.56	4.78	1
Fluoranthene	7.27	J	ug/kg	9.56	4.78	1
Pyrene	9.52	J	ug/kg	9.56	4.78	1
Benz(a)anthracene	ND		ug/kg	9.56	4.78	1
Chrysene	ND		ug/kg	9.56	4.78	1
Benzo(b)fluoranthene	ND		ug/kg	9.56	4.78	1
Benzo(k)fluoranthene	ND		ug/kg	9.56	4.78	1
Benzo(a)pyrene	ND		ug/kg	9.56	4.78	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.56	4.78	1
Dibenz(a,h)anthracene	ND		ug/kg	9.56	4.78	1
Benzo(ghi)perylene	ND		ug/kg	9.56	4.78	1
Cl2-BZ#8	ND		ug/kg	0.956	0.478	1
Cl3-BZ#18	ND		ug/kg	0.956	0.478	1
Cl3-BZ#28	ND		ug/kg	0.956	0.478	1
Cl4-BZ#44	ND		ug/kg	0.956	0.478	1
Cl4-BZ#49	ND		ug/kg	0.956	0.478	1
Cl4-BZ#52	ND		ug/kg	0.956	0.478	1
Cl4-BZ#66	ND		ug/kg	0.956	0.478	1
Cl5-BZ#87	ND		ug/kg	0.956	0.478	1
Cl5-BZ#101	ND		ug/kg	0.956	0.478	1
Cl5-BZ#105	ND		ug/kg	0.956	0.478	1
Cl5-BZ#118	ND		ug/kg	0.956	0.478	1
Cl6-BZ#128	ND		ug/kg	0.956	0.478	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-12
Client ID: B567R01MNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.956	0.478	1
CI6-BZ#153	ND		ug/kg	0.956	0.478	1
CI7-BZ#170	ND		ug/kg	0.956	0.478	1
CI7-BZ#180	ND		ug/kg	0.956	0.478	1
CI7-BZ#183	ND		ug/kg	0.956	0.478	1
CI7-BZ#184	0.479	J	ug/kg	0.956	0.478	1
CI7-BZ#187	ND		ug/kg	0.956	0.478	1
CI8-BZ#195	ND		ug/kg	0.956	0.478	1
CI9-BZ#206	ND		ug/kg	0.956	0.478	1
CI10-BZ#209	ND		ug/kg	0.956	0.478	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	87		30-150
Pyrene-d10	97		30-150
Benzo(b)fluoranthene-d12	91		30-150
DBOB	109		30-150
BZ 198	84		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-13
 Client ID: B567R01MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 20:15
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.53	4.27	1
Acenaphthylene	ND		ug/kg	8.53	4.27	1
Acenaphthene	ND		ug/kg	8.53	4.27	1
Fluorene	ND		ug/kg	8.53	4.27	1
Phenanthrene	ND		ug/kg	8.53	4.27	1
Anthracene	ND		ug/kg	8.53	4.27	1
Fluoranthene	ND		ug/kg	8.53	4.27	1
Pyrene	5.85	J	ug/kg	8.53	4.27	1
Benz(a)anthracene	ND		ug/kg	8.53	4.27	1
Chrysene	ND		ug/kg	8.53	4.27	1
Benzo(b)fluoranthene	ND		ug/kg	8.53	4.27	1
Benzo(k)fluoranthene	ND		ug/kg	8.53	4.27	1
Benzo(a)pyrene	ND		ug/kg	8.53	4.27	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.53	4.27	1
Dibenz(a,h)anthracene	ND		ug/kg	8.53	4.27	1
Benzo(ghi)perylene	ND		ug/kg	8.53	4.27	1
Cl2-BZ#8	ND		ug/kg	0.853	0.427	1
Cl3-BZ#18	ND		ug/kg	0.853	0.427	1
Cl3-BZ#28	ND		ug/kg	0.853	0.427	1
Cl4-BZ#44	ND		ug/kg	0.853	0.427	1
Cl4-BZ#49	ND		ug/kg	0.853	0.427	1
Cl4-BZ#52	ND		ug/kg	0.853	0.427	1
Cl4-BZ#66	ND		ug/kg	0.853	0.427	1
Cl5-BZ#87	ND		ug/kg	0.853	0.427	1
Cl5-BZ#101	ND		ug/kg	0.853	0.427	1
Cl5-BZ#105	ND		ug/kg	0.853	0.427	1
Cl5-BZ#118	ND		ug/kg	0.853	0.427	1
Cl6-BZ#128	ND		ug/kg	0.853	0.427	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-13
Client ID: B567R01MNC
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	ND		ug/kg	0.853	0.427	1
Cl6-BZ#153	ND		ug/kg	0.853	0.427	1
Cl7-BZ#170	ND		ug/kg	0.853	0.427	1
Cl7-BZ#180	ND		ug/kg	0.853	0.427	1
Cl7-BZ#183	ND		ug/kg	0.853	0.427	1
Cl7-BZ#184	ND		ug/kg	0.853	0.427	1
Cl7-BZ#187	ND		ug/kg	0.853	0.427	1
Cl8-BZ#195	ND		ug/kg	0.853	0.427	1
Cl9-BZ#206	ND		ug/kg	0.853	0.427	1
Cl10-BZ#209	ND		ug/kg	0.853	0.427	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	86		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	88		30-150
DBOB	103		30-150
BZ 198	82		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-14
 Client ID: B567R01MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 20:49
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.70	4.35	1
Acenaphthylene	ND		ug/kg	8.70	4.35	1
Acenaphthene	ND		ug/kg	8.70	4.35	1
Fluorene	ND		ug/kg	8.70	4.35	1
Phenanthrene	5.66	J	ug/kg	8.70	4.35	1
Anthracene	ND		ug/kg	8.70	4.35	1
Fluoranthene	8.26	J	ug/kg	8.70	4.35	1
Pyrene	11.7		ug/kg	8.70	4.35	1
Benz(a)anthracene	5.94	J	ug/kg	8.70	4.35	1
Chrysene	4.76	J	ug/kg	8.70	4.35	1
Benzo(b)fluoranthene	ND		ug/kg	8.70	4.35	1
Benzo(k)fluoranthene	ND		ug/kg	8.70	4.35	1
Benzo(a)pyrene	ND		ug/kg	8.70	4.35	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.70	4.35	1
Dibenz(a,h)anthracene	ND		ug/kg	8.70	4.35	1
Benzo(ghi)perylene	ND		ug/kg	8.70	4.35	1
Cl2-BZ#8	ND		ug/kg	0.870	0.435	1
Cl3-BZ#18	ND		ug/kg	0.870	0.435	1
Cl3-BZ#28	ND		ug/kg	0.870	0.435	1
Cl4-BZ#44	ND		ug/kg	0.870	0.435	1
Cl4-BZ#49	ND		ug/kg	0.870	0.435	1
Cl4-BZ#52	ND		ug/kg	0.870	0.435	1
Cl4-BZ#66	ND		ug/kg	0.870	0.435	1
Cl5-BZ#87	ND		ug/kg	0.870	0.435	1
Cl5-BZ#101	ND		ug/kg	0.870	0.435	1
Cl5-BZ#105	ND		ug/kg	0.870	0.435	1
Cl5-BZ#118	ND		ug/kg	0.870	0.435	1
Cl6-BZ#128	ND		ug/kg	0.870	0.435	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-14
 Client ID: B567R01MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.870	0.435	1
CI6-BZ#153	ND		ug/kg	0.870	0.435	1
CI7-BZ#170	ND		ug/kg	0.870	0.435	1
CI7-BZ#180	ND		ug/kg	0.870	0.435	1
CI7-BZ#183	ND		ug/kg	0.870	0.435	1
CI7-BZ#184	ND		ug/kg	0.870	0.435	1
CI7-BZ#187	ND		ug/kg	0.870	0.435	1
CI8-BZ#195	ND		ug/kg	0.870	0.435	1
CI9-BZ#206	ND		ug/kg	0.870	0.435	1
CI10-BZ#209	ND		ug/kg	0.870	0.435	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	85		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	84		30-150
DBOB	105		30-150
BZ 198	81		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-15
 Client ID: B567R01MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 21:22
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.78	4.89	1
Acenaphthylene	ND		ug/kg	9.78	4.89	1
Acenaphthene	ND		ug/kg	9.78	4.89	1
Fluorene	ND		ug/kg	9.78	4.89	1
Phenanthrene	ND		ug/kg	9.78	4.89	1
Anthracene	ND		ug/kg	9.78	4.89	1
Fluoranthene	5.34	J	ug/kg	9.78	4.89	1
Pyrene	8.11	J	ug/kg	9.78	4.89	1
Benz(a)anthracene	ND		ug/kg	9.78	4.89	1
Chrysene	ND		ug/kg	9.78	4.89	1
Benzo(b)fluoranthene	ND		ug/kg	9.78	4.89	1
Benzo(k)fluoranthene	ND		ug/kg	9.78	4.89	1
Benzo(a)pyrene	ND		ug/kg	9.78	4.89	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.78	4.89	1
Dibenz(a,h)anthracene	ND		ug/kg	9.78	4.89	1
Benzo(ghi)perylene	ND		ug/kg	9.78	4.89	1
Cl2-BZ#8	ND		ug/kg	0.978	0.489	1
Cl3-BZ#18	ND		ug/kg	0.978	0.489	1
Cl3-BZ#28	ND		ug/kg	0.978	0.489	1
Cl4-BZ#44	ND		ug/kg	0.978	0.489	1
Cl4-BZ#49	ND		ug/kg	0.978	0.489	1
Cl4-BZ#52	ND		ug/kg	0.978	0.489	1
Cl4-BZ#66	ND		ug/kg	0.978	0.489	1
Cl5-BZ#87	ND		ug/kg	0.978	0.489	1
Cl5-BZ#101	ND		ug/kg	0.978	0.489	1
Cl5-BZ#105	ND		ug/kg	0.978	0.489	1
Cl5-BZ#118	ND		ug/kg	0.978	0.489	1
Cl6-BZ#128	ND		ug/kg	0.978	0.489	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-15
 Client ID: B567R01MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.978	0.489	1
CI6-BZ#153	ND		ug/kg	0.978	0.489	1
CI7-BZ#170	ND		ug/kg	0.978	0.489	1
CI7-BZ#180	ND		ug/kg	0.978	0.489	1
CI7-BZ#183	ND		ug/kg	0.978	0.489	1
CI7-BZ#184	ND		ug/kg	0.978	0.489	1
CI7-BZ#187	ND		ug/kg	0.978	0.489	1
CI8-BZ#195	ND		ug/kg	0.978	0.489	1
CI9-BZ#206	ND		ug/kg	0.978	0.489	1
CI10-BZ#209	ND		ug/kg	0.978	0.489	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-150
Pyrene-d10	82		30-150
Benzo(b)fluoranthene-d12	78		30-150
DBOB	93		30-150
BZ 198	72		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-16
 Client ID: B567S01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 21:55
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.88	4.44	1
Acenaphthylene	ND		ug/kg	8.88	4.44	1
Acenaphthene	ND		ug/kg	8.88	4.44	1
Fluorene	ND		ug/kg	8.88	4.44	1
Phenanthrene	13.8		ug/kg	8.88	4.44	1
Anthracene	4.54	J	ug/kg	8.88	4.44	1
Fluoranthene	60.8		ug/kg	8.88	4.44	1
Pyrene	50.4		ug/kg	8.88	4.44	1
Benz(a)anthracene	18.6		ug/kg	8.88	4.44	1
Chrysene	18.6		ug/kg	8.88	4.44	1
Benzo(b)fluoranthene	16.7		ug/kg	8.88	4.44	1
Benzo(k)fluoranthene	8.01	J	ug/kg	8.88	4.44	1
Benzo(a)pyrene	7.51	J	ug/kg	8.88	4.44	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.88	4.44	1
Dibenz(a,h)anthracene	ND		ug/kg	8.88	4.44	1
Benzo(ghi)perylene	ND		ug/kg	8.88	4.44	1
Cl2-BZ#8	ND		ug/kg	0.888	0.444	1
Cl3-BZ#18	ND		ug/kg	0.888	0.444	1
Cl3-BZ#28	ND		ug/kg	0.888	0.444	1
Cl4-BZ#44	0.584	J	ug/kg	0.888	0.444	1
Cl4-BZ#49	1.01		ug/kg	0.888	0.444	1
Cl4-BZ#52	1.37		ug/kg	0.888	0.444	1
Cl4-BZ#66	0.666	J	ug/kg	0.888	0.444	1
Cl5-BZ#87	ND		ug/kg	0.888	0.444	1
Cl5-BZ#101	1.30		ug/kg	0.888	0.444	1
Cl5-BZ#105	ND		ug/kg	0.888	0.444	1
Cl5-BZ#118	0.713	J	ug/kg	0.888	0.444	1
Cl6-BZ#128	ND		ug/kg	0.888	0.444	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-16
Client ID: B567S01MNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.900		ug/kg	0.888	0.444	1
CI6-BZ#153	0.899		ug/kg	0.888	0.444	1
CI7-BZ#170	ND		ug/kg	0.888	0.444	1
CI7-BZ#180	ND		ug/kg	0.888	0.444	1
CI7-BZ#183	ND		ug/kg	0.888	0.444	1
CI7-BZ#184	ND		ug/kg	0.888	0.444	1
CI7-BZ#187	ND		ug/kg	0.888	0.444	1
CI8-BZ#195	ND		ug/kg	0.888	0.444	1
CI9-BZ#206	ND		ug/kg	0.888	0.444	1
CI10-BZ#209	ND		ug/kg	0.888	0.444	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	88		30-150
DBOB	104		30-150
BZ 198	83		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-17
 Client ID: B567S01MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 22:28
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.98	4.49	1
Acenaphthylene	ND		ug/kg	8.98	4.49	1
Acenaphthene	ND		ug/kg	8.98	4.49	1
Fluorene	ND		ug/kg	8.98	4.49	1
Phenanthrene	9.61		ug/kg	8.98	4.49	1
Anthracene	ND		ug/kg	8.98	4.49	1
Fluoranthene	48.0		ug/kg	8.98	4.49	1
Pyrene	42.4		ug/kg	8.98	4.49	1
Benzo(a)anthracene	17.0		ug/kg	8.98	4.49	1
Chrysene	16.2		ug/kg	8.98	4.49	1
Benzo(b)fluoranthene	16.4		ug/kg	8.98	4.49	1
Benzo(k)fluoranthene	7.47	J	ug/kg	8.98	4.49	1
Benzo(a)pyrene	7.39	J	ug/kg	8.98	4.49	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.98	4.49	1
Dibenz(a,h)anthracene	ND		ug/kg	8.98	4.49	1
Benzo(ghi)perylene	ND		ug/kg	8.98	4.49	1
Cl2-BZ#8	ND		ug/kg	0.898	0.449	1
Cl3-BZ#18	ND		ug/kg	0.898	0.449	1
Cl3-BZ#28	0.696	J	ug/kg	0.898	0.449	1
Cl4-BZ#44	0.455	J	ug/kg	0.898	0.449	1
Cl4-BZ#49	0.828	J	ug/kg	0.898	0.449	1
Cl4-BZ#52	1.26		ug/kg	0.898	0.449	1
Cl4-BZ#66	0.745	J	ug/kg	0.898	0.449	1
Cl5-BZ#87	ND		ug/kg	0.898	0.449	1
Cl5-BZ#101	1.10		ug/kg	0.898	0.449	1
Cl5-BZ#105	ND		ug/kg	0.898	0.449	1
Cl5-BZ#118	0.628	J	ug/kg	0.898	0.449	1
Cl6-BZ#128	ND		ug/kg	0.898	0.449	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-17
 Client ID: B567S01MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.694	J	ug/kg	0.898	0.449	1
CI6-BZ#153	0.757	J	ug/kg	0.898	0.449	1
CI7-BZ#170	ND		ug/kg	0.898	0.449	1
CI7-BZ#180	ND		ug/kg	0.898	0.449	1
CI7-BZ#183	ND		ug/kg	0.898	0.449	1
CI7-BZ#184	ND		ug/kg	0.898	0.449	1
CI7-BZ#187	ND		ug/kg	0.898	0.449	1
CI8-BZ#195	ND		ug/kg	0.898	0.449	1
CI9-BZ#206	ND		ug/kg	0.898	0.449	1
CI10-BZ#209	ND		ug/kg	0.898	0.449	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	66		30-150
Pyrene-d10	73		30-150
Benzo(b)fluoranthene-d12	75		30-150
DBOB	84		30-150
BZ 198	70		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-18
 Client ID: B567S01MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 23:01
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.80	4.90	1
Acenaphthylene	ND		ug/kg	9.80	4.90	1
Acenaphthene	ND		ug/kg	9.80	4.90	1
Fluorene	ND		ug/kg	9.80	4.90	1
Phenanthrene	12.7		ug/kg	9.80	4.90	1
Anthracene	4.91	J	ug/kg	9.80	4.90	1
Fluoranthene	58.2		ug/kg	9.80	4.90	1
Pyrene	45.6		ug/kg	9.80	4.90	1
Benz(a)anthracene	19.8		ug/kg	9.80	4.90	1
Chrysene	19.6		ug/kg	9.80	4.90	1
Benzo(b)fluoranthene	18.5		ug/kg	9.80	4.90	1
Benzo(k)fluoranthene	8.94	J	ug/kg	9.80	4.90	1
Benzo(a)pyrene	8.64	J	ug/kg	9.80	4.90	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.80	4.90	1
Dibenz(a,h)anthracene	ND		ug/kg	9.80	4.90	1
Benzo(ghi)perylene	ND		ug/kg	9.80	4.90	1
Cl2-BZ#8	ND		ug/kg	0.980	0.490	1
Cl3-BZ#18	ND		ug/kg	0.980	0.490	1
Cl3-BZ#28	ND		ug/kg	0.980	0.490	1
Cl4-BZ#44	0.497	J	ug/kg	0.980	0.490	1
Cl4-BZ#49	0.936	J	ug/kg	0.980	0.490	1
Cl4-BZ#52	1.30		ug/kg	0.980	0.490	1
Cl4-BZ#66	0.580	J	ug/kg	0.980	0.490	1
Cl5-BZ#87	ND		ug/kg	0.980	0.490	1
Cl5-BZ#101	1.21		ug/kg	0.980	0.490	1
Cl5-BZ#105	ND		ug/kg	0.980	0.490	1
Cl5-BZ#118	0.648	J	ug/kg	0.980	0.490	1
Cl6-BZ#128	ND		ug/kg	0.980	0.490	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-18
Client ID: B567S01MNC
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	0.997		ug/kg	0.980	0.490	1
Cl6-BZ#153	0.893	J	ug/kg	0.980	0.490	1
Cl7-BZ#170	ND		ug/kg	0.980	0.490	1
Cl7-BZ#180	ND		ug/kg	0.980	0.490	1
Cl7-BZ#183	ND		ug/kg	0.980	0.490	1
Cl7-BZ#184	ND		ug/kg	0.980	0.490	1
Cl7-BZ#187	ND		ug/kg	0.980	0.490	1
Cl8-BZ#195	ND		ug/kg	0.980	0.490	1
Cl9-BZ#206	ND		ug/kg	0.980	0.490	1
Cl10-BZ#209	ND		ug/kg	0.980	0.490	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	87		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	87		30-150
DBOB	102		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-19
 Client ID: B567S01MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/22/19 23:35
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.74	4.37	1
Acenaphthylene	ND		ug/kg	8.74	4.37	1
Acenaphthene	ND		ug/kg	8.74	4.37	1
Fluorene	ND		ug/kg	8.74	4.37	1
Phenanthrene	13.2		ug/kg	8.74	4.37	1
Anthracene	4.51	J	ug/kg	8.74	4.37	1
Fluoranthene	53.0		ug/kg	8.74	4.37	1
Pyrene	44.3		ug/kg	8.74	4.37	1
Benz(a)anthracene	16.5		ug/kg	8.74	4.37	1
Chrysene	16.1		ug/kg	8.74	4.37	1
Benzo(b)fluoranthene	15.0		ug/kg	8.74	4.37	1
Benzo(k)fluoranthene	7.07	J	ug/kg	8.74	4.37	1
Benzo(a)pyrene	7.06	J	ug/kg	8.74	4.37	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.74	4.37	1
Dibenz(a,h)anthracene	ND		ug/kg	8.74	4.37	1
Benzo(ghi)perylene	ND		ug/kg	8.74	4.37	1
Cl2-BZ#8	1.07		ug/kg	0.874	0.437	1
Cl3-BZ#18	3.57		ug/kg	0.874	0.437	1
Cl3-BZ#28	9.49		ug/kg	0.874	0.437	1
Cl4-BZ#44	ND		ug/kg	0.874	0.437	1
Cl4-BZ#49	0.720	J	ug/kg	0.874	0.437	1
Cl4-BZ#52	0.924		ug/kg	0.874	0.437	1
Cl4-BZ#66	0.541	J	ug/kg	0.874	0.437	1
Cl5-BZ#87	ND		ug/kg	0.874	0.437	1
Cl5-BZ#101	1.09		ug/kg	0.874	0.437	1
Cl5-BZ#105	ND		ug/kg	0.874	0.437	1
Cl5-BZ#118	0.486	J	ug/kg	0.874	0.437	1
Cl6-BZ#128	ND		ug/kg	0.874	0.437	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-19
Client ID: B567S01MND
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.785	J	ug/kg	0.874	0.437	1
CI6-BZ#153	0.646	J	ug/kg	0.874	0.437	1
CI7-BZ#170	ND		ug/kg	0.874	0.437	1
CI7-BZ#180	ND		ug/kg	0.874	0.437	1
CI7-BZ#183	ND		ug/kg	0.874	0.437	1
CI7-BZ#184	ND		ug/kg	0.874	0.437	1
CI7-BZ#187	ND		ug/kg	0.874	0.437	1
CI8-BZ#195	ND		ug/kg	0.874	0.437	1
CI9-BZ#206	ND		ug/kg	0.874	0.437	1
CI10-BZ#209	ND		ug/kg	0.874	0.437	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	93		30-150
Benzo(b)fluoranthene-d12	87		30-150
DBOB	96		30-150
BZ 198	79		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-20
 Client ID: B567S01MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 00:08
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.65	4.83	1
Acenaphthylene	ND		ug/kg	9.65	4.83	1
Acenaphthene	ND		ug/kg	9.65	4.83	1
Fluorene	ND		ug/kg	9.65	4.83	1
Phenanthrene	12.2		ug/kg	9.65	4.83	1
Anthracene	ND		ug/kg	9.65	4.83	1
Fluoranthene	52.7		ug/kg	9.65	4.83	1
Pyrene	44.6		ug/kg	9.65	4.83	1
Benz(a)anthracene	17.4		ug/kg	9.65	4.83	1
Chrysene	16.6		ug/kg	9.65	4.83	1
Benzo(b)fluoranthene	14.6		ug/kg	9.65	4.83	1
Benzo(k)fluoranthene	9.68		ug/kg	9.65	4.83	1
Benzo(a)pyrene	7.76	J	ug/kg	9.65	4.83	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.65	4.83	1
Dibenz(a,h)anthracene	ND		ug/kg	9.65	4.83	1
Benzo(ghi)perylene	ND		ug/kg	9.65	4.83	1
Cl2-BZ#8	ND		ug/kg	0.965	0.483	1
Cl3-BZ#18	ND		ug/kg	0.965	0.483	1
Cl3-BZ#28	ND		ug/kg	0.965	0.483	1
Cl4-BZ#44	ND		ug/kg	0.965	0.483	1
Cl4-BZ#49	1.02		ug/kg	0.965	0.483	1
Cl4-BZ#52	1.37		ug/kg	0.965	0.483	1
Cl4-BZ#66	0.620	J	ug/kg	0.965	0.483	1
Cl5-BZ#87	ND		ug/kg	0.965	0.483	1
Cl5-BZ#101	1.09		ug/kg	0.965	0.483	1
Cl5-BZ#105	ND		ug/kg	0.965	0.483	1
Cl5-BZ#118	0.571	J	ug/kg	0.965	0.483	1
Cl6-BZ#128	ND		ug/kg	0.965	0.483	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-20
Client ID: B567S01MNE
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.737	J	ug/kg	0.965	0.483	1
CI6-BZ#153	0.756	J	ug/kg	0.965	0.483	1
CI7-BZ#170	ND		ug/kg	0.965	0.483	1
CI7-BZ#180	ND		ug/kg	0.965	0.483	1
CI7-BZ#183	ND		ug/kg	0.965	0.483	1
CI7-BZ#184	ND		ug/kg	0.965	0.483	1
CI7-BZ#187	ND		ug/kg	0.965	0.483	1
CI8-BZ#195	ND		ug/kg	0.965	0.483	1
CI9-BZ#206	ND		ug/kg	0.965	0.483	1
CI10-BZ#209	ND		ug/kg	0.965	0.483	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	86		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	100		30-150
BZ 198	75		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-21
 Client ID: B567S02MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 00:42
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.52	4.26	1
Acenaphthylene	ND		ug/kg	8.52	4.26	1
Acenaphthene	4.42	J	ug/kg	8.52	4.26	1
Fluorene	ND		ug/kg	8.52	4.26	1
Phenanthrene	16.6		ug/kg	8.52	4.26	1
Anthracene	7.01	J	ug/kg	8.52	4.26	1
Fluoranthene	95.9		ug/kg	8.52	4.26	1
Pyrene	70.5		ug/kg	8.52	4.26	1
Benz(a)anthracene	23.4		ug/kg	8.52	4.26	1
Chrysene	22.8		ug/kg	8.52	4.26	1
Benzo(b)fluoranthene	15.9		ug/kg	8.52	4.26	1
Benzo(k)fluoranthene	10.9		ug/kg	8.52	4.26	1
Benzo(a)pyrene	7.99	J	ug/kg	8.52	4.26	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.52	4.26	1
Dibenz(a,h)anthracene	ND		ug/kg	8.52	4.26	1
Benzo(ghi)perylene	4.30	J	ug/kg	8.52	4.26	1
Cl2-BZ#8	ND		ug/kg	0.852	0.426	1
Cl3-BZ#18	1.66		ug/kg	0.852	0.426	1
Cl3-BZ#28	1.12		ug/kg	0.852	0.426	1
Cl4-BZ#44	0.468	J	ug/kg	0.852	0.426	1
Cl4-BZ#49	0.922		ug/kg	0.852	0.426	1
Cl4-BZ#52	1.56		ug/kg	0.852	0.426	1
Cl4-BZ#66	0.493	J	ug/kg	0.852	0.426	1
Cl5-BZ#87	ND		ug/kg	0.852	0.426	1
Cl5-BZ#101	0.780	J	ug/kg	0.852	0.426	1
Cl5-BZ#105	ND		ug/kg	0.852	0.426	1
Cl5-BZ#118	0.572	J	ug/kg	0.852	0.426	1
Cl6-BZ#128	ND		ug/kg	0.852	0.426	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-21
Client ID: B567S02MNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.907		ug/kg	0.852	0.426	1
CI6-BZ#153	0.782	J	ug/kg	0.852	0.426	1
CI7-BZ#170	ND		ug/kg	0.852	0.426	1
CI7-BZ#180	ND		ug/kg	0.852	0.426	1
CI7-BZ#183	ND		ug/kg	0.852	0.426	1
CI7-BZ#184	ND		ug/kg	0.852	0.426	1
CI7-BZ#187	ND		ug/kg	0.852	0.426	1
CI8-BZ#195	ND		ug/kg	0.852	0.426	1
CI9-BZ#206	ND		ug/kg	0.852	0.426	1
CI10-BZ#209	ND		ug/kg	0.852	0.426	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	76		30-150
Pyrene-d10	88		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	99		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-22
 Client ID: B567S02MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 03:21
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.40	4.70	1
Acenaphthylene	ND		ug/kg	9.40	4.70	1
Acenaphthene	ND		ug/kg	9.40	4.70	1
Fluorene	ND		ug/kg	9.40	4.70	1
Phenanthrene	14.0		ug/kg	9.40	4.70	1
Anthracene	6.02	J	ug/kg	9.40	4.70	1
Fluoranthene	89.0		ug/kg	9.40	4.70	1
Pyrene	70.0		ug/kg	9.40	4.70	1
Benzo(a)anthracene	21.0		ug/kg	9.40	4.70	1
Chrysene	19.3		ug/kg	9.40	4.70	1
Benzo(b)fluoranthene	16.4		ug/kg	9.40	4.70	1
Benzo(k)fluoranthene	8.86	J	ug/kg	9.40	4.70	1
Benzo(a)pyrene	7.76	J	ug/kg	9.40	4.70	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.40	4.70	1
Dibenz(a,h)anthracene	ND		ug/kg	9.40	4.70	1
Benzo(ghi)perylene	ND		ug/kg	9.40	4.70	1
Cl2-BZ#8	ND		ug/kg	0.940	0.470	1
Cl3-BZ#18	1.19		ug/kg	0.940	0.470	1
Cl3-BZ#28	1.04		ug/kg	0.940	0.470	1
Cl4-BZ#44	ND		ug/kg	0.940	0.470	1
Cl4-BZ#49	0.772	J	ug/kg	0.940	0.470	1
Cl4-BZ#52	1.35		ug/kg	0.940	0.470	1
Cl4-BZ#66	0.596	J	ug/kg	0.940	0.470	1
Cl5-BZ#87	ND		ug/kg	0.940	0.470	1
Cl5-BZ#101	0.864	J	ug/kg	0.940	0.470	1
Cl5-BZ#105	ND		ug/kg	0.940	0.470	1
Cl5-BZ#118	ND		ug/kg	0.940	0.470	1
Cl6-BZ#128	ND		ug/kg	0.940	0.470	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-22
Client ID: B567S02MNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.581	J	ug/kg	0.940	0.470	1
CI6-BZ#153	0.533	J	ug/kg	0.940	0.470	1
CI7-BZ#170	ND		ug/kg	0.940	0.470	1
CI7-BZ#180	ND		ug/kg	0.940	0.470	1
CI7-BZ#183	ND		ug/kg	0.940	0.470	1
CI7-BZ#184	ND		ug/kg	0.940	0.470	1
CI7-BZ#187	ND		ug/kg	0.940	0.470	1
CI8-BZ#195	ND		ug/kg	0.940	0.470	1
CI9-BZ#206	ND		ug/kg	0.940	0.470	1
CI10-BZ#209	ND		ug/kg	0.940	0.470	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		30-150
Pyrene-d10	87		30-150
Benzo(b)fluoranthene-d12	79		30-150
DBOB	80		30-150
BZ 198	69		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-23
 Client ID: B567S02MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 04:28
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.74	4.37	1
Acenaphthylene	ND		ug/kg	8.74	4.37	1
Acenaphthene	ND		ug/kg	8.74	4.37	1
Fluorene	ND		ug/kg	8.74	4.37	1
Phenanthrene	17.5		ug/kg	8.74	4.37	1
Anthracene	8.98		ug/kg	8.74	4.37	1
Fluoranthene	113		ug/kg	8.74	4.37	1
Pyrene	82.4		ug/kg	8.74	4.37	1
Benz(a)anthracene	29.1		ug/kg	8.74	4.37	1
Chrysene	29.1		ug/kg	8.74	4.37	1
Benzo(b)fluoranthene	19.5		ug/kg	8.74	4.37	1
Benzo(k)fluoranthene	15.1		ug/kg	8.74	4.37	1
Benzo(a)pyrene	11.4		ug/kg	8.74	4.37	1
Indeno(1,2,3-cd)Pyrene	4.52	J	ug/kg	8.74	4.37	1
Dibenz(a,h)anthracene	ND		ug/kg	8.74	4.37	1
Benzo(ghi)perylene	5.83	J	ug/kg	8.74	4.37	1
Cl2-BZ#8	ND		ug/kg	0.874	0.437	1
Cl3-BZ#18	1.80		ug/kg	0.874	0.437	1
Cl3-BZ#28	0.448	J	ug/kg	0.874	0.437	1
Cl4-BZ#44	0.619	J	ug/kg	0.874	0.437	1
Cl4-BZ#49	0.815	J	ug/kg	0.874	0.437	1
Cl4-BZ#52	1.62		ug/kg	0.874	0.437	1
Cl4-BZ#66	0.768	J	ug/kg	0.874	0.437	1
Cl5-BZ#87	ND		ug/kg	0.874	0.437	1
Cl5-BZ#101	1.03		ug/kg	0.874	0.437	1
Cl5-BZ#105	ND		ug/kg	0.874	0.437	1
Cl5-BZ#118	0.628	J	ug/kg	0.874	0.437	1
Cl6-BZ#128	ND		ug/kg	0.874	0.437	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-23
 Client ID: B567S02MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.909		ug/kg	0.874	0.437	1
CI6-BZ#153	0.791	J	ug/kg	0.874	0.437	1
CI7-BZ#170	ND		ug/kg	0.874	0.437	1
CI7-BZ#180	ND		ug/kg	0.874	0.437	1
CI7-BZ#183	ND		ug/kg	0.874	0.437	1
CI7-BZ#184	ND		ug/kg	0.874	0.437	1
CI7-BZ#187	ND		ug/kg	0.874	0.437	1
CI8-BZ#195	ND		ug/kg	0.874	0.437	1
CI9-BZ#206	ND		ug/kg	0.874	0.437	1
CI10-BZ#209	ND		ug/kg	0.874	0.437	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	90		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	103		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-24
 Client ID: B567S02MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 05:02
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.90	4.45	1
Acenaphthylene	ND		ug/kg	8.90	4.45	1
Acenaphthene	ND		ug/kg	8.90	4.45	1
Fluorene	ND		ug/kg	8.90	4.45	1
Phenanthrene	17.2		ug/kg	8.90	4.45	1
Anthracene	8.18	J	ug/kg	8.90	4.45	1
Fluoranthene	102		ug/kg	8.90	4.45	1
Pyrene	76.9		ug/kg	8.90	4.45	1
Benz(a)anthracene	28.0		ug/kg	8.90	4.45	1
Chrysene	25.0		ug/kg	8.90	4.45	1
Benzo(b)fluoranthene	19.2		ug/kg	8.90	4.45	1
Benzo(k)fluoranthene	12.6		ug/kg	8.90	4.45	1
Benzo(a)pyrene	10.1		ug/kg	8.90	4.45	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.90	4.45	1
Dibenz(a,h)anthracene	ND		ug/kg	8.90	4.45	1
Benzo(ghi)perylene	4.48	J	ug/kg	8.90	4.45	1
Cl2-BZ#8	ND		ug/kg	0.890	0.445	1
Cl3-BZ#18	2.59		ug/kg	0.890	0.445	1
Cl3-BZ#28	ND		ug/kg	0.890	0.445	1
Cl4-BZ#44	ND		ug/kg	0.890	0.445	1
Cl4-BZ#49	0.862	J	ug/kg	0.890	0.445	1
Cl4-BZ#52	1.38		ug/kg	0.890	0.445	1
Cl4-BZ#66	0.507	J	ug/kg	0.890	0.445	1
Cl5-BZ#87	ND		ug/kg	0.890	0.445	1
Cl5-BZ#101	0.861	J	ug/kg	0.890	0.445	1
Cl5-BZ#105	ND		ug/kg	0.890	0.445	1
Cl5-BZ#118	0.452	J	ug/kg	0.890	0.445	1
Cl6-BZ#128	ND		ug/kg	0.890	0.445	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-24
Client ID: B567S02MND
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	0.664	J	ug/kg	0.890	0.445	1
Cl6-BZ#153	0.702	J	ug/kg	0.890	0.445	1
Cl7-BZ#170	ND		ug/kg	0.890	0.445	1
Cl7-BZ#180	ND		ug/kg	0.890	0.445	1
Cl7-BZ#183	ND		ug/kg	0.890	0.445	1
Cl7-BZ#184	ND		ug/kg	0.890	0.445	1
Cl7-BZ#187	ND		ug/kg	0.890	0.445	1
Cl8-BZ#195	ND		ug/kg	0.890	0.445	1
Cl9-BZ#206	ND		ug/kg	0.890	0.445	1
Cl10-BZ#209	ND		ug/kg	0.890	0.445	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	91		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	104		30-150
BZ 198	81		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-25
 Client ID: B567S02MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 05:35
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.85	4.42	1
Acenaphthylene	ND		ug/kg	8.85	4.42	1
Acenaphthene	ND		ug/kg	8.85	4.42	1
Fluorene	ND		ug/kg	8.85	4.42	1
Phenanthrene	16.3		ug/kg	8.85	4.42	1
Anthracene	7.03	J	ug/kg	8.85	4.42	1
Fluoranthene	89.8		ug/kg	8.85	4.42	1
Pyrene	62.5		ug/kg	8.85	4.42	1
Benz(a)anthracene	19.7		ug/kg	8.85	4.42	1
Chrysene	20.4		ug/kg	8.85	4.42	1
Benzo(b)fluoranthene	13.9		ug/kg	8.85	4.42	1
Benzo(k)fluoranthene	9.77		ug/kg	8.85	4.42	1
Benzo(a)pyrene	7.12	J	ug/kg	8.85	4.42	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.85	4.42	1
Dibenz(a,h)anthracene	ND		ug/kg	8.85	4.42	1
Benzo(ghi)perylene	ND		ug/kg	8.85	4.42	1
Cl2-BZ#8	ND		ug/kg	0.885	0.442	1
Cl3-BZ#18	1.77		ug/kg	0.885	0.442	1
Cl3-BZ#28	ND		ug/kg	0.885	0.442	1
Cl4-BZ#44	ND		ug/kg	0.885	0.442	1
Cl4-BZ#49	0.680	J	ug/kg	0.885	0.442	1
Cl4-BZ#52	0.999		ug/kg	0.885	0.442	1
Cl4-BZ#66	0.457	J	ug/kg	0.885	0.442	1
Cl5-BZ#87	ND		ug/kg	0.885	0.442	1
Cl5-BZ#101	0.621	J	ug/kg	0.885	0.442	1
Cl5-BZ#105	ND		ug/kg	0.885	0.442	1
Cl5-BZ#118	ND		ug/kg	0.885	0.442	1
Cl6-BZ#128	ND		ug/kg	0.885	0.442	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-25
Client ID: B567S02MNE
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.560	J	ug/kg	0.885	0.442	1
CI6-BZ#153	0.629	J	ug/kg	0.885	0.442	1
CI7-BZ#170	ND		ug/kg	0.885	0.442	1
CI7-BZ#180	ND		ug/kg	0.885	0.442	1
CI7-BZ#183	ND		ug/kg	0.885	0.442	1
CI7-BZ#184	ND		ug/kg	0.885	0.442	1
CI7-BZ#187	ND		ug/kg	0.885	0.442	1
CI8-BZ#195	ND		ug/kg	0.885	0.442	1
CI9-BZ#206	ND		ug/kg	0.885	0.442	1
CI10-BZ#209	ND		ug/kg	0.885	0.442	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	84		30-150
Pyrene-d10	86		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	101		30-150
BZ 198	76		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-26
 Client ID: B567S03MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 06:09
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.60	4.80	1
Acenaphthylene	ND		ug/kg	9.60	4.80	1
Acenaphthene	ND		ug/kg	9.60	4.80	1
Fluorene	ND		ug/kg	9.60	4.80	1
Phenanthrene	20.7		ug/kg	9.60	4.80	1
Anthracene	6.51	J	ug/kg	9.60	4.80	1
Fluoranthene	76.0		ug/kg	9.60	4.80	1
Pyrene	55.3		ug/kg	9.60	4.80	1
Benz(a)anthracene	21.0		ug/kg	9.60	4.80	1
Chrysene	19.8		ug/kg	9.60	4.80	1
Benzo(b)fluoranthene	15.9		ug/kg	9.60	4.80	1
Benzo(k)fluoranthene	9.18	J	ug/kg	9.60	4.80	1
Benzo(a)pyrene	8.42	J	ug/kg	9.60	4.80	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.60	4.80	1
Dibenz(a,h)anthracene	ND		ug/kg	9.60	4.80	1
Benzo(ghi)perylene	ND		ug/kg	9.60	4.80	1
Cl2-BZ#8	ND		ug/kg	0.960	0.480	1
Cl3-BZ#18	1.79		ug/kg	0.960	0.480	1
Cl3-BZ#28	0.855	J	ug/kg	0.960	0.480	1
Cl4-BZ#44	0.676	J	ug/kg	0.960	0.480	1
Cl4-BZ#49	0.943	J	ug/kg	0.960	0.480	1
Cl4-BZ#52	1.57		ug/kg	0.960	0.480	1
Cl4-BZ#66	0.793	J	ug/kg	0.960	0.480	1
Cl5-BZ#87	ND		ug/kg	0.960	0.480	1
Cl5-BZ#101	1.07		ug/kg	0.960	0.480	1
Cl5-BZ#105	ND		ug/kg	0.960	0.480	1
Cl5-BZ#118	0.771	J	ug/kg	0.960	0.480	1
Cl6-BZ#128	ND		ug/kg	0.960	0.480	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-26
Client ID: B567S03MNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.958	J	ug/kg	0.960	0.480	1
CI6-BZ#153	0.876	J	ug/kg	0.960	0.480	1
CI7-BZ#170	ND		ug/kg	0.960	0.480	1
CI7-BZ#180	ND		ug/kg	0.960	0.480	1
CI7-BZ#183	ND		ug/kg	0.960	0.480	1
CI7-BZ#184	ND		ug/kg	0.960	0.480	1
CI7-BZ#187	ND		ug/kg	0.960	0.480	1
CI8-BZ#195	ND		ug/kg	0.960	0.480	1
CI9-BZ#206	ND		ug/kg	0.960	0.480	1
CI10-BZ#209	ND		ug/kg	0.960	0.480	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	86		30-150
Pyrene-d10	82		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	94		30-150
BZ 198	77		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-27
 Client ID: B567S03MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 06:42
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.44	4.22	1
Acenaphthylene	ND		ug/kg	8.44	4.22	1
Acenaphthene	ND		ug/kg	8.44	4.22	1
Fluorene	ND		ug/kg	8.44	4.22	1
Phenanthrene	24.5		ug/kg	8.44	4.22	1
Anthracene	6.76	J	ug/kg	8.44	4.22	1
Fluoranthene	89.9		ug/kg	8.44	4.22	1
Pyrene	71.0		ug/kg	8.44	4.22	1
Benz(a)anthracene	24.0		ug/kg	8.44	4.22	1
Chrysene	25.6		ug/kg	8.44	4.22	1
Benzo(b)fluoranthene	19.6		ug/kg	8.44	4.22	1
Benzo(k)fluoranthene	9.61		ug/kg	8.44	4.22	1
Benzo(a)pyrene	10.1		ug/kg	8.44	4.22	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.44	4.22	1
Dibenz(a,h)anthracene	ND		ug/kg	8.44	4.22	1
Benzo(ghi)perylene	5.27	J	ug/kg	8.44	4.22	1
Cl2-BZ#8	ND		ug/kg	0.844	0.422	1
Cl3-BZ#18	0.936		ug/kg	0.844	0.422	1
Cl3-BZ#28	0.728	J	ug/kg	0.844	0.422	1
Cl4-BZ#44	0.666	J	ug/kg	0.844	0.422	1
Cl4-BZ#49	1.34		ug/kg	0.844	0.422	1
Cl4-BZ#52	1.66		ug/kg	0.844	0.422	1
Cl4-BZ#66	0.993		ug/kg	0.844	0.422	1
Cl5-BZ#87	ND		ug/kg	0.844	0.422	1
Cl5-BZ#101	1.61		ug/kg	0.844	0.422	1
Cl5-BZ#105	ND		ug/kg	0.844	0.422	1
Cl5-BZ#118	1.01		ug/kg	0.844	0.422	1
Cl6-BZ#128	ND		ug/kg	0.844	0.422	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-27
Client ID: B567S03MNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.27		ug/kg	0.844	0.422	1
CI6-BZ#153	1.21		ug/kg	0.844	0.422	1
CI7-BZ#170	ND		ug/kg	0.844	0.422	1
CI7-BZ#180	ND		ug/kg	0.844	0.422	1
CI7-BZ#183	ND		ug/kg	0.844	0.422	1
CI7-BZ#184	ND		ug/kg	0.844	0.422	1
CI7-BZ#187	ND		ug/kg	0.844	0.422	1
CI8-BZ#195	ND		ug/kg	0.844	0.422	1
CI9-BZ#206	ND		ug/kg	0.844	0.422	1
CI10-BZ#209	ND		ug/kg	0.844	0.422	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	83		30-150
DBOB	96		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-28
 Client ID: B567S03MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 07:15
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.29	4.65	1
Acenaphthylene	ND		ug/kg	9.29	4.65	1
Acenaphthene	ND		ug/kg	9.29	4.65	1
Fluorene	ND		ug/kg	9.29	4.65	1
Phenanthrene	22.6		ug/kg	9.29	4.65	1
Anthracene	6.83	J	ug/kg	9.29	4.65	1
Fluoranthene	81.8		ug/kg	9.29	4.65	1
Pyrene	64.4		ug/kg	9.29	4.65	1
Benz(a)anthracene	21.4		ug/kg	9.29	4.65	1
Chrysene	23.2		ug/kg	9.29	4.65	1
Benzo(b)fluoranthene	16.2		ug/kg	9.29	4.65	1
Benzo(k)fluoranthene	9.50		ug/kg	9.29	4.65	1
Benzo(a)pyrene	8.58	J	ug/kg	9.29	4.65	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.29	4.65	1
Dibenz(a,h)anthracene	ND		ug/kg	9.29	4.65	1
Benzo(ghi)perylene	ND		ug/kg	9.29	4.65	1
Cl2-BZ#8	ND		ug/kg	0.929	0.465	1
Cl3-BZ#18	1.82		ug/kg	0.929	0.465	1
Cl3-BZ#28	0.742	J	ug/kg	0.929	0.465	1
Cl4-BZ#44	ND		ug/kg	0.929	0.465	1
Cl4-BZ#49	1.16		ug/kg	0.929	0.465	1
Cl4-BZ#52	1.63		ug/kg	0.929	0.465	1
Cl4-BZ#66	0.816	J	ug/kg	0.929	0.465	1
Cl5-BZ#87	ND		ug/kg	0.929	0.465	1
Cl5-BZ#101	1.38		ug/kg	0.929	0.465	1
Cl5-BZ#105	ND		ug/kg	0.929	0.465	1
Cl5-BZ#118	0.886	J	ug/kg	0.929	0.465	1
Cl6-BZ#128	ND		ug/kg	0.929	0.465	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-28
 Client ID: B567S03MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.27		ug/kg	0.929	0.465	1
CI6-BZ#153	0.945		ug/kg	0.929	0.465	1
CI7-BZ#170	ND		ug/kg	0.929	0.465	1
CI7-BZ#180	ND		ug/kg	0.929	0.465	1
CI7-BZ#183	ND		ug/kg	0.929	0.465	1
CI7-BZ#184	ND		ug/kg	0.929	0.465	1
CI7-BZ#187	ND		ug/kg	0.929	0.465	1
CI8-BZ#195	ND		ug/kg	0.929	0.465	1
CI9-BZ#206	ND		ug/kg	0.929	0.465	1
CI10-BZ#209	ND		ug/kg	0.929	0.465	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-150
Pyrene-d10	87		30-150
Benzo(b)fluoranthene-d12	80		30-150
DBOB	100		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-29
 Client ID: B567S03MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 07:49
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.26	4.63	1
Acenaphthylene	ND		ug/kg	9.26	4.63	1
Acenaphthene	ND		ug/kg	9.26	4.63	1
Fluorene	ND		ug/kg	9.26	4.63	1
Phenanthrene	18.4		ug/kg	9.26	4.63	1
Anthracene	5.81	J	ug/kg	9.26	4.63	1
Fluoranthene	74.5		ug/kg	9.26	4.63	1
Pyrene	58.6		ug/kg	9.26	4.63	1
Benzo(a)anthracene	22.4		ug/kg	9.26	4.63	1
Chrysene	22.9		ug/kg	9.26	4.63	1
Benzo(b)fluoranthene	15.9		ug/kg	9.26	4.63	1
Benzo(k)fluoranthene	11.8		ug/kg	9.26	4.63	1
Benzo(a)pyrene	10.1		ug/kg	9.26	4.63	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.26	4.63	1
Dibenz(a,h)anthracene	ND		ug/kg	9.26	4.63	1
Benzo(ghi)perylene	5.48	J	ug/kg	9.26	4.63	1
Cl2-BZ#8	ND		ug/kg	0.926	0.463	1
Cl3-BZ#18	1.63		ug/kg	0.926	0.463	1
Cl3-BZ#28	0.814	J	ug/kg	0.926	0.463	1
Cl4-BZ#44	0.515	J	ug/kg	0.926	0.463	1
Cl4-BZ#49	0.978		ug/kg	0.926	0.463	1
Cl4-BZ#52	1.65		ug/kg	0.926	0.463	1
Cl4-BZ#66	0.872	J	ug/kg	0.926	0.463	1
Cl5-BZ#87	ND		ug/kg	0.926	0.463	1
Cl5-BZ#101	1.30		ug/kg	0.926	0.463	1
Cl5-BZ#105	ND		ug/kg	0.926	0.463	1
Cl5-BZ#118	0.807	J	ug/kg	0.926	0.463	1
Cl6-BZ#128	ND		ug/kg	0.926	0.463	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-29
Client ID: B567S03MND
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.06		ug/kg	0.926	0.463	1
CI6-BZ#153	0.961		ug/kg	0.926	0.463	1
CI7-BZ#170	ND		ug/kg	0.926	0.463	1
CI7-BZ#180	0.611	J	ug/kg	0.926	0.463	1
CI7-BZ#183	ND		ug/kg	0.926	0.463	1
CI7-BZ#184	ND		ug/kg	0.926	0.463	1
CI7-BZ#187	ND		ug/kg	0.926	0.463	1
CI8-BZ#195	ND		ug/kg	0.926	0.463	1
CI9-BZ#206	ND		ug/kg	0.926	0.463	1
CI10-BZ#209	ND		ug/kg	0.926	0.463	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	80		30-150
DBOB	102		30-150
BZ 198	77		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-30
 Client ID: B567S03MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 08:22
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.86	4.43	1
Acenaphthylene	ND		ug/kg	8.86	4.43	1
Acenaphthene	ND		ug/kg	8.86	4.43	1
Fluorene	ND		ug/kg	8.86	4.43	1
Phenanthrene	23.2		ug/kg	8.86	4.43	1
Anthracene	7.32	J	ug/kg	8.86	4.43	1
Fluoranthene	92.6		ug/kg	8.86	4.43	1
Pyrene	72.6		ug/kg	8.86	4.43	1
Benz(a)anthracene	25.3		ug/kg	8.86	4.43	1
Chrysene	26.4		ug/kg	8.86	4.43	1
Benzo(b)fluoranthene	17.3		ug/kg	8.86	4.43	1
Benzo(k)fluoranthene	13.8		ug/kg	8.86	4.43	1
Benzo(a)pyrene	10.8		ug/kg	8.86	4.43	1
Indeno(1,2,3-cd)Pyrene	4.65	J	ug/kg	8.86	4.43	1
Dibenz(a,h)anthracene	ND		ug/kg	8.86	4.43	1
Benzo(ghi)perylene	5.50	J	ug/kg	8.86	4.43	1
Cl2-BZ#8	ND		ug/kg	0.886	0.443	1
Cl3-BZ#18	1.20		ug/kg	0.886	0.443	1
Cl3-BZ#28	0.884	J	ug/kg	0.886	0.443	1
Cl4-BZ#44	0.903		ug/kg	0.886	0.443	1
Cl4-BZ#49	1.28		ug/kg	0.886	0.443	1
Cl4-BZ#52	2.32		ug/kg	0.886	0.443	1
Cl4-BZ#66	1.02		ug/kg	0.886	0.443	1
Cl5-BZ#87	ND		ug/kg	0.886	0.443	1
Cl5-BZ#101	1.53		ug/kg	0.886	0.443	1
Cl5-BZ#105	ND		ug/kg	0.886	0.443	1
Cl5-BZ#118	1.02		ug/kg	0.886	0.443	1
Cl6-BZ#128	ND		ug/kg	0.886	0.443	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-30
Client ID: B567S03MNE
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.43		ug/kg	0.886	0.443	1
CI6-BZ#153	1.14		ug/kg	0.886	0.443	1
CI7-BZ#170	ND		ug/kg	0.886	0.443	1
CI7-BZ#180	ND		ug/kg	0.886	0.443	1
CI7-BZ#183	ND		ug/kg	0.886	0.443	1
CI7-BZ#184	ND		ug/kg	0.886	0.443	1
CI7-BZ#187	ND		ug/kg	0.886	0.443	1
CI8-BZ#195	ND		ug/kg	0.886	0.443	1
CI9-BZ#206	ND		ug/kg	0.886	0.443	1
CI10-BZ#209	ND		ug/kg	0.886	0.443	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	89		30-150
Pyrene-d10	94		30-150
Benzo(b)fluoranthene-d12	88		30-150
DBOB	107		30-150
BZ 198	81		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-31
 Client ID: B567S04MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 08:56
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.73	4.86	1
Acenaphthylene	ND		ug/kg	9.73	4.86	1
Acenaphthene	ND		ug/kg	9.73	4.86	1
Fluorene	ND		ug/kg	9.73	4.86	1
Phenanthrene	7.75	J	ug/kg	9.73	4.86	1
Anthracene	ND		ug/kg	9.73	4.86	1
Fluoranthene	27.3		ug/kg	9.73	4.86	1
Pyrene	21.9		ug/kg	9.73	4.86	1
Benz(a)anthracene	6.58	J	ug/kg	9.73	4.86	1
Chrysene	6.80	J	ug/kg	9.73	4.86	1
Benzo(b)fluoranthene	7.09	J	ug/kg	9.73	4.86	1
Benzo(k)fluoranthene	ND		ug/kg	9.73	4.86	1
Benzo(a)pyrene	ND		ug/kg	9.73	4.86	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.73	4.86	1
Dibenz(a,h)anthracene	ND		ug/kg	9.73	4.86	1
Benzo(ghi)perylene	ND		ug/kg	9.73	4.86	1
Cl2-BZ#8	ND		ug/kg	0.973	0.486	1
Cl3-BZ#18	1.17		ug/kg	0.973	0.486	1
Cl3-BZ#28	ND		ug/kg	0.973	0.486	1
Cl4-BZ#44	ND		ug/kg	0.973	0.486	1
Cl4-BZ#49	ND		ug/kg	0.973	0.486	1
Cl4-BZ#52	ND		ug/kg	0.973	0.486	1
Cl4-BZ#66	ND		ug/kg	0.973	0.486	1
Cl5-BZ#87	ND		ug/kg	0.973	0.486	1
Cl5-BZ#101	ND		ug/kg	0.973	0.486	1
Cl5-BZ#105	ND		ug/kg	0.973	0.486	1
Cl5-BZ#118	ND		ug/kg	0.973	0.486	1
Cl6-BZ#128	ND		ug/kg	0.973	0.486	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-31
Client ID: B567S04MNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.973	0.486	1
CI6-BZ#153	ND		ug/kg	0.973	0.486	1
CI7-BZ#170	ND		ug/kg	0.973	0.486	1
CI7-BZ#180	ND		ug/kg	0.973	0.486	1
CI7-BZ#183	ND		ug/kg	0.973	0.486	1
CI7-BZ#184	ND		ug/kg	0.973	0.486	1
CI7-BZ#187	ND		ug/kg	0.973	0.486	1
CI8-BZ#195	ND		ug/kg	0.973	0.486	1
CI9-BZ#206	ND		ug/kg	0.973	0.486	1
CI10-BZ#209	ND		ug/kg	0.973	0.486	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	88		30-150
Pyrene-d10	91		30-150
Benzo(b)fluoranthene-d12	86		30-150
DBOB	103		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-32
 Client ID: B567S04MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 09:30
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.93	4.46	1
Acenaphthylene	ND		ug/kg	8.93	4.46	1
Acenaphthene	ND		ug/kg	8.93	4.46	1
Fluorene	ND		ug/kg	8.93	4.46	1
Phenanthrene	7.32	J	ug/kg	8.93	4.46	1
Anthracene	ND		ug/kg	8.93	4.46	1
Fluoranthene	32.0		ug/kg	8.93	4.46	1
Pyrene	26.9		ug/kg	8.93	4.46	1
Benz(a)anthracene	9.25		ug/kg	8.93	4.46	1
Chrysene	8.87	J	ug/kg	8.93	4.46	1
Benzo(b)fluoranthene	9.04		ug/kg	8.93	4.46	1
Benzo(k)fluoranthene	6.29	J	ug/kg	8.93	4.46	1
Benzo(a)pyrene	4.49	J	ug/kg	8.93	4.46	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.93	4.46	1
Dibenz(a,h)anthracene	ND		ug/kg	8.93	4.46	1
Benzo(ghi)perylene	ND		ug/kg	8.93	4.46	1
Cl2-BZ#8	ND		ug/kg	0.893	0.446	1
Cl3-BZ#18	1.27		ug/kg	0.893	0.446	1
Cl3-BZ#28	ND		ug/kg	0.893	0.446	1
Cl4-BZ#44	ND		ug/kg	0.893	0.446	1
Cl4-BZ#49	ND		ug/kg	0.893	0.446	1
Cl4-BZ#52	ND		ug/kg	0.893	0.446	1
Cl4-BZ#66	ND		ug/kg	0.893	0.446	1
Cl5-BZ#87	ND		ug/kg	0.893	0.446	1
Cl5-BZ#101	0.505	J	ug/kg	0.893	0.446	1
Cl5-BZ#105	ND		ug/kg	0.893	0.446	1
Cl5-BZ#118	ND		ug/kg	0.893	0.446	1
Cl6-BZ#128	ND		ug/kg	0.893	0.446	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-32
Client ID: B567S04MNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.468	J	ug/kg	0.893	0.446	1
CI6-BZ#153	0.449	J	ug/kg	0.893	0.446	1
CI7-BZ#170	ND		ug/kg	0.893	0.446	1
CI7-BZ#180	ND		ug/kg	0.893	0.446	1
CI7-BZ#183	ND		ug/kg	0.893	0.446	1
CI7-BZ#184	ND		ug/kg	0.893	0.446	1
CI7-BZ#187	ND		ug/kg	0.893	0.446	1
CI8-BZ#195	ND		ug/kg	0.893	0.446	1
CI9-BZ#206	ND		ug/kg	0.893	0.446	1
CI10-BZ#209	ND		ug/kg	0.893	0.446	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	85		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	84		30-150
DBOB	106		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-33
 Client ID: B567S04MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 10:04
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.65	4.32	1
Acenaphthylene	ND		ug/kg	8.65	4.32	1
Acenaphthene	ND		ug/kg	8.65	4.32	1
Fluorene	ND		ug/kg	8.65	4.32	1
Phenanthrene	6.63	J	ug/kg	8.65	4.32	1
Anthracene	ND		ug/kg	8.65	4.32	1
Fluoranthene	30.0		ug/kg	8.65	4.32	1
Pyrene	24.6		ug/kg	8.65	4.32	1
Benz(a)anthracene	7.71	J	ug/kg	8.65	4.32	1
Chrysene	7.94	J	ug/kg	8.65	4.32	1
Benzo(b)fluoranthene	9.07		ug/kg	8.65	4.32	1
Benzo(k)fluoranthene	4.68	J	ug/kg	8.65	4.32	1
Benzo(a)pyrene	ND		ug/kg	8.65	4.32	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.65	4.32	1
Dibenz(a,h)anthracene	ND		ug/kg	8.65	4.32	1
Benzo(ghi)perylene	ND		ug/kg	8.65	4.32	1
Cl2-BZ#8	ND		ug/kg	0.865	0.432	1
Cl3-BZ#18	ND		ug/kg	0.865	0.432	1
Cl3-BZ#28	ND		ug/kg	0.865	0.432	1
Cl4-BZ#44	ND		ug/kg	0.865	0.432	1
Cl4-BZ#49	ND		ug/kg	0.865	0.432	1
Cl4-BZ#52	ND		ug/kg	0.865	0.432	1
Cl4-BZ#66	ND		ug/kg	0.865	0.432	1
Cl5-BZ#87	ND		ug/kg	0.865	0.432	1
Cl5-BZ#101	ND		ug/kg	0.865	0.432	1
Cl5-BZ#105	ND		ug/kg	0.865	0.432	1
Cl5-BZ#118	0.453	J	ug/kg	0.865	0.432	1
Cl6-BZ#128	ND		ug/kg	0.865	0.432	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-33
Client ID: B567S04MNC
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.865	0.432	1
CI6-BZ#153	ND		ug/kg	0.865	0.432	1
CI7-BZ#170	ND		ug/kg	0.865	0.432	1
CI7-BZ#180	ND		ug/kg	0.865	0.432	1
CI7-BZ#183	ND		ug/kg	0.865	0.432	1
CI7-BZ#184	ND		ug/kg	0.865	0.432	1
CI7-BZ#187	ND		ug/kg	0.865	0.432	1
CI8-BZ#195	ND		ug/kg	0.865	0.432	1
CI9-BZ#206	ND		ug/kg	0.865	0.432	1
CI10-BZ#209	ND		ug/kg	0.865	0.432	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	85		30-150
Pyrene-d10	91		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	101		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-34
 Client ID: B567S04MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 10:37
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.63	4.82	1
Acenaphthylene	ND		ug/kg	9.63	4.82	1
Acenaphthene	ND		ug/kg	9.63	4.82	1
Fluorene	ND		ug/kg	9.63	4.82	1
Phenanthrene	6.12	J	ug/kg	9.63	4.82	1
Anthracene	ND		ug/kg	9.63	4.82	1
Fluoranthene	23.8		ug/kg	9.63	4.82	1
Pyrene	17.6		ug/kg	9.63	4.82	1
Benz(a)anthracene	6.09	J	ug/kg	9.63	4.82	1
Chrysene	6.39	J	ug/kg	9.63	4.82	1
Benzo(b)fluoranthene	6.74	J	ug/kg	9.63	4.82	1
Benzo(k)fluoranthene	ND		ug/kg	9.63	4.82	1
Benzo(a)pyrene	ND		ug/kg	9.63	4.82	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.63	4.82	1
Dibenz(a,h)anthracene	ND		ug/kg	9.63	4.82	1
Benzo(ghi)perylene	ND		ug/kg	9.63	4.82	1
Cl2-BZ#8	ND		ug/kg	0.963	0.482	1
Cl3-BZ#18	ND		ug/kg	0.963	0.482	1
Cl3-BZ#28	ND		ug/kg	0.963	0.482	1
Cl4-BZ#44	ND		ug/kg	0.963	0.482	1
Cl4-BZ#49	ND		ug/kg	0.963	0.482	1
Cl4-BZ#52	ND		ug/kg	0.963	0.482	1
Cl4-BZ#66	ND		ug/kg	0.963	0.482	1
Cl5-BZ#87	ND		ug/kg	0.963	0.482	1
Cl5-BZ#101	ND		ug/kg	0.963	0.482	1
Cl5-BZ#105	ND		ug/kg	0.963	0.482	1
Cl5-BZ#118	ND		ug/kg	0.963	0.482	1
Cl6-BZ#128	ND		ug/kg	0.963	0.482	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-34
Client ID: B567S04MND
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.963	0.482	1
CI6-BZ#153	ND		ug/kg	0.963	0.482	1
CI7-BZ#170	ND		ug/kg	0.963	0.482	1
CI7-BZ#180	ND		ug/kg	0.963	0.482	1
CI7-BZ#183	ND		ug/kg	0.963	0.482	1
CI7-BZ#184	ND		ug/kg	0.963	0.482	1
CI7-BZ#187	ND		ug/kg	0.963	0.482	1
CI8-BZ#195	ND		ug/kg	0.963	0.482	1
CI9-BZ#206	ND		ug/kg	0.963	0.482	1
CI10-BZ#209	ND		ug/kg	0.963	0.482	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	83		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	95		30-150
BZ 198	72		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-35
 Client ID: B567S04MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 11:11
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.85	4.42	1
Acenaphthylene	ND		ug/kg	8.85	4.42	1
Acenaphthene	ND		ug/kg	8.85	4.42	1
Fluorene	ND		ug/kg	8.85	4.42	1
Phenanthrene	6.78	J	ug/kg	8.85	4.42	1
Anthracene	ND		ug/kg	8.85	4.42	1
Fluoranthene	29.6		ug/kg	8.85	4.42	1
Pyrene	24.6		ug/kg	8.85	4.42	1
Benz(a)anthracene	7.62	J	ug/kg	8.85	4.42	1
Chrysene	8.08	J	ug/kg	8.85	4.42	1
Benzo(b)fluoranthene	7.22	J	ug/kg	8.85	4.42	1
Benzo(k)fluoranthene	6.25	J	ug/kg	8.85	4.42	1
Benzo(a)pyrene	ND		ug/kg	8.85	4.42	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.85	4.42	1
Dibenz(a,h)anthracene	ND		ug/kg	8.85	4.42	1
Benzo(ghi)perylene	ND		ug/kg	8.85	4.42	1
Cl2-BZ#8	ND		ug/kg	0.885	0.442	1
Cl3-BZ#18	ND		ug/kg	0.885	0.442	1
Cl3-BZ#28	ND		ug/kg	0.885	0.442	1
Cl4-BZ#44	ND		ug/kg	0.885	0.442	1
Cl4-BZ#49	ND		ug/kg	0.885	0.442	1
Cl4-BZ#52	ND		ug/kg	0.885	0.442	1
Cl4-BZ#66	ND		ug/kg	0.885	0.442	1
Cl5-BZ#87	ND		ug/kg	0.885	0.442	1
Cl5-BZ#101	0.677	J	ug/kg	0.885	0.442	1
Cl5-BZ#105	ND		ug/kg	0.885	0.442	1
Cl5-BZ#118	ND		ug/kg	0.885	0.442	1
Cl6-BZ#128	ND		ug/kg	0.885	0.442	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-35
Client ID: B567S04MNE
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.460	J	ug/kg	0.885	0.442	1
CI6-BZ#153	0.463	J	ug/kg	0.885	0.442	1
CI7-BZ#170	ND		ug/kg	0.885	0.442	1
CI7-BZ#180	ND		ug/kg	0.885	0.442	1
CI7-BZ#183	ND		ug/kg	0.885	0.442	1
CI7-BZ#184	ND		ug/kg	0.885	0.442	1
CI7-BZ#187	ND		ug/kg	0.885	0.442	1
CI8-BZ#195	ND		ug/kg	0.885	0.442	1
CI9-BZ#206	ND		ug/kg	0.885	0.442	1
CI10-BZ#209	ND		ug/kg	0.885	0.442	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	83		30-150
DBOB	98		30-150
BZ 198	75		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-36
 Client ID: B567S05MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 11:45
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.71	4.85	1
Acenaphthylene	ND		ug/kg	9.71	4.85	1
Acenaphthene	ND		ug/kg	9.71	4.85	1
Fluorene	ND		ug/kg	9.71	4.85	1
Phenanthrene	8.76	J	ug/kg	9.71	4.85	1
Anthracene	ND		ug/kg	9.71	4.85	1
Fluoranthene	67.9		ug/kg	9.71	4.85	1
Pyrene	102		ug/kg	9.71	4.85	1
Benz(a)anthracene	23.9		ug/kg	9.71	4.85	1
Chrysene	24.8		ug/kg	9.71	4.85	1
Benzo(b)fluoranthene	21.2		ug/kg	9.71	4.85	1
Benzo(k)fluoranthene	16.1		ug/kg	9.71	4.85	1
Benzo(a)pyrene	13.7		ug/kg	9.71	4.85	1
Indeno(1,2,3-cd)Pyrene	5.28	J	ug/kg	9.71	4.85	1
Dibenz(a,h)anthracene	ND		ug/kg	9.71	4.85	1
Benzo(ghi)perylene	5.95	J	ug/kg	9.71	4.85	1
Cl2-BZ#8	ND		ug/kg	0.971	0.485	1
Cl3-BZ#18	ND		ug/kg	0.971	0.485	1
Cl3-BZ#28	ND		ug/kg	0.971	0.485	1
Cl4-BZ#44	ND		ug/kg	0.971	0.485	1
Cl4-BZ#49	ND		ug/kg	0.971	0.485	1
Cl4-BZ#52	ND		ug/kg	0.971	0.485	1
Cl4-BZ#66	ND		ug/kg	0.971	0.485	1
Cl5-BZ#87	ND		ug/kg	0.971	0.485	1
Cl5-BZ#101	ND		ug/kg	0.971	0.485	1
Cl5-BZ#105	ND		ug/kg	0.971	0.485	1
Cl5-BZ#118	ND		ug/kg	0.971	0.485	1
Cl6-BZ#128	ND		ug/kg	0.971	0.485	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-36
Client ID: B567S05MNA
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.971	0.485	1
CI6-BZ#153	ND		ug/kg	0.971	0.485	1
CI7-BZ#170	ND		ug/kg	0.971	0.485	1
CI7-BZ#180	ND		ug/kg	0.971	0.485	1
CI7-BZ#183	ND		ug/kg	0.971	0.485	1
CI7-BZ#184	ND		ug/kg	0.971	0.485	1
CI7-BZ#187	ND		ug/kg	0.971	0.485	1
CI8-BZ#195	ND		ug/kg	0.971	0.485	1
CI9-BZ#206	ND		ug/kg	0.971	0.485	1
CI10-BZ#209	ND		ug/kg	0.971	0.485	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	89		30-150
Pyrene-d10	94		30-150
Benzo(b)fluoranthene-d12	88		30-150
DBOB	104		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-37
 Client ID: B567S05MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 12:19
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.78	4.89	1
Acenaphthylene	ND		ug/kg	9.78	4.89	1
Acenaphthene	ND		ug/kg	9.78	4.89	1
Fluorene	ND		ug/kg	9.78	4.89	1
Phenanthrene	15.0		ug/kg	9.78	4.89	1
Anthracene	6.18	J	ug/kg	9.78	4.89	1
Fluoranthene	111		ug/kg	9.78	4.89	1
Pyrene	156		ug/kg	9.78	4.89	1
Benz(a)anthracene	38.4		ug/kg	9.78	4.89	1
Chrysene	42.5		ug/kg	9.78	4.89	1
Benzo(b)fluoranthene	29.6		ug/kg	9.78	4.89	1
Benzo(k)fluoranthene	24.3		ug/kg	9.78	4.89	1
Benzo(a)pyrene	25.3		ug/kg	9.78	4.89	1
Indeno(1,2,3-cd)Pyrene	8.35	J	ug/kg	9.78	4.89	1
Dibenz(a,h)anthracene	ND		ug/kg	9.78	4.89	1
Benzo(ghi)perylene	10.7		ug/kg	9.78	4.89	1
Cl2-BZ#8	ND		ug/kg	0.978	0.489	1
Cl3-BZ#18	1.65		ug/kg	0.978	0.489	1
Cl3-BZ#28	ND		ug/kg	0.978	0.489	1
Cl4-BZ#44	ND		ug/kg	0.978	0.489	1
Cl4-BZ#49	ND		ug/kg	0.978	0.489	1
Cl4-BZ#52	ND		ug/kg	0.978	0.489	1
Cl4-BZ#66	ND		ug/kg	0.978	0.489	1
Cl5-BZ#87	ND		ug/kg	0.978	0.489	1
Cl5-BZ#101	0.566	J	ug/kg	0.978	0.489	1
Cl5-BZ#105	ND		ug/kg	0.978	0.489	1
Cl5-BZ#118	0.533	J	ug/kg	0.978	0.489	1
Cl6-BZ#128	ND		ug/kg	0.978	0.489	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-37
Client ID: B567S05MNB
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.622	J	ug/kg	0.978	0.489	1
CI6-BZ#153	0.491	J	ug/kg	0.978	0.489	1
CI7-BZ#170	ND		ug/kg	0.978	0.489	1
CI7-BZ#180	ND		ug/kg	0.978	0.489	1
CI7-BZ#183	ND		ug/kg	0.978	0.489	1
CI7-BZ#184	ND		ug/kg	0.978	0.489	1
CI7-BZ#187	ND		ug/kg	0.978	0.489	1
CI8-BZ#195	ND		ug/kg	0.978	0.489	1
CI9-BZ#206	ND		ug/kg	0.978	0.489	1
CI10-BZ#209	ND		ug/kg	0.978	0.489	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	86		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	86		30-150
DBOB	103		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-38
 Client ID: B567S05MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 12:54
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.88	4.44	1
Acenaphthylene	ND		ug/kg	8.88	4.44	1
Acenaphthene	ND		ug/kg	8.88	4.44	1
Fluorene	ND		ug/kg	8.88	4.44	1
Phenanthrene	13.4		ug/kg	8.88	4.44	1
Anthracene	6.06	J	ug/kg	8.88	4.44	1
Fluoranthene	95.0		ug/kg	8.88	4.44	1
Pyrene	127		ug/kg	8.88	4.44	1
Benz(a)anthracene	32.2		ug/kg	8.88	4.44	1
Chrysene	35.3		ug/kg	8.88	4.44	1
Benzo(b)fluoranthene	24.9		ug/kg	8.88	4.44	1
Benzo(k)fluoranthene	18.0		ug/kg	8.88	4.44	1
Benzo(a)pyrene	18.0		ug/kg	8.88	4.44	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.88	4.44	1
Dibenz(a,h)anthracene	ND		ug/kg	8.88	4.44	1
Benzo(ghi)perylene	7.92	J	ug/kg	8.88	4.44	1
Cl2-BZ#8	ND		ug/kg	0.888	0.444	1
Cl3-BZ#18	ND		ug/kg	0.888	0.444	1
Cl3-BZ#28	ND		ug/kg	0.888	0.444	1
Cl4-BZ#44	ND		ug/kg	0.888	0.444	1
Cl4-BZ#49	ND		ug/kg	0.888	0.444	1
Cl4-BZ#52	ND		ug/kg	0.888	0.444	1
Cl4-BZ#66	ND		ug/kg	0.888	0.444	1
Cl5-BZ#87	ND		ug/kg	0.888	0.444	1
Cl5-BZ#101	ND		ug/kg	0.888	0.444	1
Cl5-BZ#105	ND		ug/kg	0.888	0.444	1
Cl5-BZ#118	ND		ug/kg	0.888	0.444	1
Cl6-BZ#128	ND		ug/kg	0.888	0.444	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-38
 Client ID: B567S05MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	ND		ug/kg	0.888	0.444	1
Cl6-BZ#153	ND		ug/kg	0.888	0.444	1
Cl7-BZ#170	ND		ug/kg	0.888	0.444	1
Cl7-BZ#180	ND		ug/kg	0.888	0.444	1
Cl7-BZ#183	ND		ug/kg	0.888	0.444	1
Cl7-BZ#184	ND		ug/kg	0.888	0.444	1
Cl7-BZ#187	ND		ug/kg	0.888	0.444	1
Cl8-BZ#195	ND		ug/kg	0.888	0.444	1
Cl9-BZ#206	ND		ug/kg	0.888	0.444	1
Cl10-BZ#209	ND		ug/kg	0.888	0.444	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	71		30-150
Pyrene-d10	90		30-150
Benzo(b)fluoranthene-d12	83		30-150
DBOB	100		30-150
BZ 198	73		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-39
 Client ID: B567S05MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 13:28
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.62	4.81	1
Acenaphthylene	ND		ug/kg	9.62	4.81	1
Acenaphthene	ND		ug/kg	9.62	4.81	1
Fluorene	ND		ug/kg	9.62	4.81	1
Phenanthrene	9.61	J	ug/kg	9.62	4.81	1
Anthracene	5.12	J	ug/kg	9.62	4.81	1
Fluoranthene	67.1		ug/kg	9.62	4.81	1
Pyrene	99.0		ug/kg	9.62	4.81	1
Benz(a)anthracene	26.4		ug/kg	9.62	4.81	1
Chrysene	27.1		ug/kg	9.62	4.81	1
Benzo(b)fluoranthene	22.0		ug/kg	9.62	4.81	1
Benzo(k)fluoranthene	17.4		ug/kg	9.62	4.81	1
Benzo(a)pyrene	18.7		ug/kg	9.62	4.81	1
Indeno(1,2,3-cd)Pyrene	6.80	J	ug/kg	9.62	4.81	1
Dibenz(a,h)anthracene	ND		ug/kg	9.62	4.81	1
Benzo(ghi)perylene	7.89	J	ug/kg	9.62	4.81	1
Cl2-BZ#8	ND		ug/kg	0.962	0.481	1
Cl3-BZ#18	ND		ug/kg	0.962	0.481	1
Cl3-BZ#28	ND		ug/kg	0.962	0.481	1
Cl4-BZ#44	ND		ug/kg	0.962	0.481	1
Cl4-BZ#49	ND		ug/kg	0.962	0.481	1
Cl4-BZ#52	ND		ug/kg	0.962	0.481	1
Cl4-BZ#66	ND		ug/kg	0.962	0.481	1
Cl5-BZ#87	ND		ug/kg	0.962	0.481	1
Cl5-BZ#101	ND		ug/kg	0.962	0.481	1
Cl5-BZ#105	ND		ug/kg	0.962	0.481	1
Cl5-BZ#118	ND		ug/kg	0.962	0.481	1
Cl6-BZ#128	ND		ug/kg	0.962	0.481	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-39
Client ID: B567S05MND
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.962	0.481	1
CI6-BZ#153	ND		ug/kg	0.962	0.481	1
CI7-BZ#170	ND		ug/kg	0.962	0.481	1
CI7-BZ#180	ND		ug/kg	0.962	0.481	1
CI7-BZ#183	ND		ug/kg	0.962	0.481	1
CI7-BZ#184	ND		ug/kg	0.962	0.481	1
CI7-BZ#187	ND		ug/kg	0.962	0.481	1
CI8-BZ#195	ND		ug/kg	0.962	0.481	1
CI9-BZ#206	ND		ug/kg	0.962	0.481	1
CI10-BZ#209	ND		ug/kg	0.962	0.481	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-150
Pyrene-d10	91		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	97		30-150
BZ 198	75		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-40
 Client ID: B567S05MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 14:03
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.04	4.52	1
Acenaphthylene	ND		ug/kg	9.04	4.52	1
Acenaphthene	ND		ug/kg	9.04	4.52	1
Fluorene	ND		ug/kg	9.04	4.52	1
Phenanthrene	6.67	J	ug/kg	9.04	4.52	1
Anthracene	ND		ug/kg	9.04	4.52	1
Fluoranthene	48.3		ug/kg	9.04	4.52	1
Pyrene	80.5		ug/kg	9.04	4.52	1
Benz(a)anthracene	17.0		ug/kg	9.04	4.52	1
Chrysene	18.5		ug/kg	9.04	4.52	1
Benzo(b)fluoranthene	16.4		ug/kg	9.04	4.52	1
Benzo(k)fluoranthene	11.5		ug/kg	9.04	4.52	1
Benzo(a)pyrene	11.4		ug/kg	9.04	4.52	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.04	4.52	1
Dibenz(a,h)anthracene	ND		ug/kg	9.04	4.52	1
Benzo(ghi)perylene	5.59	J	ug/kg	9.04	4.52	1
Cl2-BZ#8	ND		ug/kg	0.904	0.452	1
Cl3-BZ#18	ND		ug/kg	0.904	0.452	1
Cl3-BZ#28	ND		ug/kg	0.904	0.452	1
Cl4-BZ#44	ND		ug/kg	0.904	0.452	1
Cl4-BZ#49	ND		ug/kg	0.904	0.452	1
Cl4-BZ#52	ND		ug/kg	0.904	0.452	1
Cl4-BZ#66	ND		ug/kg	0.904	0.452	1
Cl5-BZ#87	ND		ug/kg	0.904	0.452	1
Cl5-BZ#101	ND		ug/kg	0.904	0.452	1
Cl5-BZ#105	ND		ug/kg	0.904	0.452	1
Cl5-BZ#118	ND		ug/kg	0.904	0.452	1
Cl6-BZ#128	ND		ug/kg	0.904	0.452	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-40
Client ID: B567S05MNE
Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	ND		ug/kg	0.904	0.452	1
CI6-BZ#153	ND		ug/kg	0.904	0.452	1
CI7-BZ#170	ND		ug/kg	0.904	0.452	1
CI7-BZ#180	ND		ug/kg	0.904	0.452	1
CI7-BZ#183	ND		ug/kg	0.904	0.452	1
CI7-BZ#184	ND		ug/kg	0.904	0.452	1
CI7-BZ#187	ND		ug/kg	0.904	0.452	1
CI8-BZ#195	ND		ug/kg	0.904	0.452	1
CI9-BZ#206	ND		ug/kg	0.904	0.452	1
CI10-BZ#209	ND		ug/kg	0.904	0.452	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	77		30-150
Pyrene-d10	89		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	102		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/22/19 10:10
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 05:00
Cleanup Method: EPA 3611B
Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194644-1					
Naphthalene	ND		ug/kg	10.0	5.00
Acenaphthylene	ND		ug/kg	10.0	5.00
Acenaphthene	ND		ug/kg	10.0	5.00
Fluorene	ND		ug/kg	10.0	5.00
Phenanthrene	ND		ug/kg	10.0	5.00
Anthracene	ND		ug/kg	10.0	5.00
Fluoranthene	ND		ug/kg	10.0	5.00
Pyrene	ND		ug/kg	10.0	5.00
Benz(a)anthracene	ND		ug/kg	10.0	5.00
Chrysene	ND		ug/kg	10.0	5.00
Benzo(b)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(k)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(a)pyrene	ND		ug/kg	10.0	5.00
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	10.0	5.00
Dibenz(a,h)anthracene	ND		ug/kg	10.0	5.00
Benzo(ghi)perylene	ND		ug/kg	10.0	5.00
Cl2-BZ#8	ND		ug/kg	1.00	0.500
Cl3-BZ#18	ND		ug/kg	1.00	0.500
Cl3-BZ#28	ND		ug/kg	1.00	0.500
Cl4-BZ#44	ND		ug/kg	1.00	0.500
Cl4-BZ#49	ND		ug/kg	1.00	0.500
Cl4-BZ#52	ND		ug/kg	1.00	0.500
Cl4-BZ#66	ND		ug/kg	1.00	0.500
Cl5-BZ#87	ND		ug/kg	1.00	0.500
Cl5-BZ#101	ND		ug/kg	1.00	0.500
Cl5-BZ#105	ND		ug/kg	1.00	0.500
Cl5-BZ#118	ND		ug/kg	1.00	0.500
Cl6-BZ#128	ND		ug/kg	1.00	0.500
Cl6-BZ#138	ND		ug/kg	1.00	0.500



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

**Method Blank Analysis
 Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/22/19 10:10
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 05:00
Cleanup Method: EPA 3611B
Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194644-1					
Cl6-BZ#153	ND		ug/kg	1.00	0.500
Cl7-BZ#170	ND		ug/kg	1.00	0.500
Cl7-BZ#180	ND		ug/kg	1.00	0.500
Cl7-BZ#183	ND		ug/kg	1.00	0.500
Cl7-BZ#184	ND		ug/kg	1.00	0.500
Cl7-BZ#187	ND		ug/kg	1.00	0.500
Cl8-BZ#195	ND		ug/kg	1.00	0.500
Cl9-BZ#206	ND		ug/kg	1.00	0.500
Cl10-BZ#209	ND		ug/kg	1.00	0.500

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-150
Pyrene-d10	93		30-150
Benzo(b)fluoranthene-d12	100		30-150
DBOB	71		30-150
BZ 198	66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/22/19 10:43
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 06:45
Cleanup Method: EPA 3611B
Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 21-40 Batch: WG1194647-1					
Naphthalene	ND		ug/kg	10.0	5.00
Acenaphthylene	ND		ug/kg	10.0	5.00
Acenaphthene	ND		ug/kg	10.0	5.00
Fluorene	ND		ug/kg	10.0	5.00
Phenanthrene	ND		ug/kg	10.0	5.00
Anthracene	ND		ug/kg	10.0	5.00
Fluoranthene	ND		ug/kg	10.0	5.00
Pyrene	ND		ug/kg	10.0	5.00
Benz(a)anthracene	ND		ug/kg	10.0	5.00
Chrysene	ND		ug/kg	10.0	5.00
Benzo(b)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(k)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(a)pyrene	ND		ug/kg	10.0	5.00
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	10.0	5.00
Dibenz(a,h)anthracene	ND		ug/kg	10.0	5.00
Benzo(ghi)perylene	ND		ug/kg	10.0	5.00
C12-BZ#8	ND		ug/kg	1.00	0.500
C13-BZ#18	ND		ug/kg	1.00	0.500
C13-BZ#28	ND		ug/kg	1.00	0.500
C14-BZ#44	ND		ug/kg	1.00	0.500
C14-BZ#49	ND		ug/kg	1.00	0.500
C14-BZ#52	ND		ug/kg	1.00	0.500
C14-BZ#66	ND		ug/kg	1.00	0.500
C15-BZ#87	ND		ug/kg	1.00	0.500
C15-BZ#101	ND		ug/kg	1.00	0.500
C15-BZ#105	ND		ug/kg	1.00	0.500
C15-BZ#118	ND		ug/kg	1.00	0.500
C16-BZ#128	ND		ug/kg	1.00	0.500
C16-BZ#138	ND		ug/kg	1.00	0.500

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**Method Blank Analysis
Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)

Analytical Date: 01/22/19 10:43

Analyst: GP

Extraction Method: EPA 3570

Extraction Date: 01/04/19 06:45

Cleanup Method: EPA 3611B

Cleanup Date: 01/07/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 21-40 Batch: WG1194647-1					
Cl6-BZ#153	ND		ug/kg	1.00	0.500
Cl7-BZ#170	ND		ug/kg	1.00	0.500
Cl7-BZ#180	ND		ug/kg	1.00	0.500
Cl7-BZ#183	ND		ug/kg	1.00	0.500
Cl7-BZ#184	ND		ug/kg	1.00	0.500
Cl7-BZ#187	ND		ug/kg	1.00	0.500
Cl8-BZ#195	ND		ug/kg	1.00	0.500
Cl9-BZ#206	ND		ug/kg	1.00	0.500
Cl10-BZ#209	ND		ug/kg	1.00	0.500

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	69		30-150
Pyrene-d10	84		30-150
Benzo(b)fluoranthene-d12	80		30-150
DBOB	74		30-150
BZ 198	62		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194644-2 WG1194644-3								
Naphthalene	73		70		50-120	4		30
Acenaphthylene	68		66		50-120	3		30
Acenaphthene	73		69		50-120	6		30
Fluorene	77		71		50-120	8		30
Phenanthrene	77		72		50-120	7		30
Anthracene	78		74		50-120	5		30
Fluoranthene	86		84		50-120	2		30
Pyrene	79		80		50-120	1		30
Benz(a)anthracene	85		83		50-120	2		30
Chrysene	85		86		50-120	1		30
Benzo(b)fluoranthene	93		91		50-120	2		30
Benzo(k)fluoranthene	82		82		50-120	0		30
Benzo(a)pyrene	84		86		50-120	2		30
Indeno(1,2,3-cd)Pyrene	81		78		50-120	4		30
Dibenz(a,h)anthracene	85		83		50-120	2		30
Benzo(ghi)perylene	83		80		50-120	4		30
Cl2-BZ#8	70		67		50-120	4		30
Cl3-BZ#18	70		68		50-120	3		30
Cl3-BZ#28	70		70		50-120	0		30
Cl4-BZ#44	76		76		50-120	0		30
Cl4-BZ#49	76		77		50-120	1		30
Cl4-BZ#52	75		74		50-120	1		30
Cl4-BZ#66	77		77		50-120	0		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194644-2 WG1194644-3								
Cl5-BZ#87	76		77		50-120	1		30
Cl5-BZ#101	80		80		50-120	0		30
Cl5-BZ#105	78		79		50-120	1		30
Cl5-BZ#118	76		76		50-120	0		30
Cl6-BZ#128	72		71		50-120	1		30
Cl6-BZ#138	77		75		50-120	3		30
Cl6-BZ#153	76		76		50-120	0		30
Cl7-BZ#170	69		68		50-120	1		30
Cl7-BZ#180	74		73		50-120	1		30
Cl7-BZ#183	68		68		50-120	0		30
Cl7-BZ#184	76		75		50-120	1		30
Cl7-BZ#187	70		69		50-120	1		30
Cl8-BZ#195	70		69		50-120	1		30
Cl9-BZ#206	71		70		50-120	1		30
Cl10-BZ#209	77		78		50-120	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	75		76		30-150
Pyrene-d10	86		87		30-150
Benzo(b)fluoranthene-d12	93		90		30-150
DBOB	70		64		30-150
BZ 198	67		65		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194647-2 WG1194647-3								
Naphthalene	66		62		50-120	6		30
Acenaphthylene	65		62		50-120	5		30
Acenaphthene	68		65		50-120	5		30
Fluorene	70		67		50-120	4		30
Phenanthrene	71		68		50-120	4		30
Anthracene	75		70		50-120	7		30
Fluoranthene	79		77		50-120	3		30
Pyrene	74		72		50-120	3		30
Benz(a)anthracene	77		74		50-120	4		30
Chrysene	79		76		50-120	4		30
Benzo(b)fluoranthene	83		82		50-120	1		30
Benzo(k)fluoranthene	74		71		50-120	4		30
Benzo(a)pyrene	77		74		50-120	4		30
Indeno(1,2,3-cd)Pyrene	72		69		50-120	4		30
Dibenz(a,h)anthracene	76		73		50-120	4		30
Benzo(ghi)perylene	75		72		50-120	4		30
Cl2-BZ#8	68		62		50-120	9		30
Cl3-BZ#18	68		62		50-120	9		30
Cl3-BZ#28	69		64		50-120	8		30
Cl4-BZ#44	76		70		50-120	8		30
Cl4-BZ#49	74		69		50-120	7		30
Cl4-BZ#52	72		67		50-120	7		30
Cl4-BZ#66	72		68		50-120	6		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194647-2 WG1194647-3								
CI5-BZ#87	73		69		50-120	6		30
CI5-BZ#101	75		71		50-120	5		30
CI5-BZ#105	73		69		50-120	6		30
CI5-BZ#118	71		68		50-120	4		30
CI6-BZ#128	67		63		50-120	6		30
CI6-BZ#138	70		67		50-120	4		30
CI6-BZ#153	71		67		50-120	6		30
CI7-BZ#170	64		61		50-120	5		30
CI7-BZ#180	68		65		50-120	5		30
CI7-BZ#183	64		60		50-120	6		30
CI7-BZ#184	70		67		50-120	4		30
CI7-BZ#187	65		62		50-120	5		30
CI8-BZ#195	64		62		50-120	3		30
CI9-BZ#206	66		64		50-120	3		30
CI10-BZ#209	73		70		50-120	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	67		64		30-150
Pyrene-d10	79		76		30-150
Benzo(b)fluoranthene-d12	80		79		30-150
DBOB	63		61		30-150
BZ 198	60		59		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194644-6 WG1194644-7 QC Sample: L1853052-01 Client ID: B567PREMNA												
Naphthalene	ND	498	383	77		384	81		50-120	0		30
Acenaphthylene	ND	498	394	79		384	81		50-120	3		30
Acenaphthene	ND	498	390	78		381	80		50-120	2		30
Fluorene	ND	498	406	82		395	83		50-120	3		30
Phenanthrene	ND	498	438	88		422	89		50-120	4		30
Anthracene	ND	498	388	78		380	80		50-120	2		30
Fluoranthene	ND	498	441	89		427	90		50-120	3		30
Pyrene	ND	498	390	78		381	80		50-120	2		30
Benz(a)anthracene	ND	498	473	95		464	98		50-120	2		30
Chrysene	ND	498	383	77		358	75		50-120	7		30
Benzo(b)fluoranthene	ND	498	453	91		433	91		50-120	5		30
Benzo(k)fluoranthene	ND	498	361	73		361	76		50-120	0		30
Benzo(a)pyrene	ND	498	408	82		383	81		50-120	6		30
Indeno(1,2,3-cd)Pyrene	ND	498	509	102		487	102		50-120	4		30
Dibenz(a,h)anthracene	ND	498	426	86		418	88		50-120	2		30
Benzo(ghi)perylene	ND	498	406	82		398	84		50-120	2		30
Cl2-BZ#8	ND	99.6	73.1	73		70.6	74		50-120	3		30
Cl3-BZ#18	ND	99.6	79.1	79		76.8	81		50-120	3		30
Cl3-BZ#28	ND	99.6	78.8	79		76.6	81		50-120	3		30
Cl4-BZ#44	ND	99.6	76.4	77		72.2	76		50-120	6		30
Cl4-BZ#49	ND	99.6	65.6	66		58.5	62		50-120	11		30
Cl4-BZ#52	ND	99.6	79.6	80		78.8	83		50-120	1		30
Cl4-BZ#66	ND	99.6	75.4	76		71.9	76		50-120	5		30

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194644-6 WG1194644-7 QC Sample: L1853052-01 Client ID: B567PREMNA												
CI5-BZ#87	ND	99.6	73.8	74		70.9	75		50-120	4		30
CI5-BZ#101	ND	99.6	75.4	76		72.7	77		50-120	4		30
CI5-BZ#105	ND	99.6	69.2	70		64.7	68		50-120	7		30
CI5-BZ#118	ND	99.6	70.0	70		66.6	70		50-120	5		30
CI6-BZ#128	ND	99.6	77.9	78		74.9	79		50-120	4		30
CI6-BZ#138	ND	99.6	76.7	77		73.8	78		50-120	4		30
CI6-BZ#153	ND	99.6	77.9	78		74.7	79		50-120	4		30
CI7-BZ#170	ND	99.6	78.4	79		74.8	79		50-120	5		30
CI7-BZ#180	ND	99.6	74.0	74		70.4	74		50-120	5		30
CI7-BZ#183	ND	99.6	63.1	63		59.1	62		50-120	7		30
CI7-BZ#184	ND	99.6	75.1	75		72.6	76		50-120	3		30
CI7-BZ#187	ND	99.6	83.9	84		79.8	84		50-120	5		30
CI8-BZ#195	ND	99.6	79.7	80		76.5	81		50-120	4		30
CI9-BZ#206	ND	99.6	75.8	76		72.5	76		50-120	4		30
CI10-BZ#209	ND	99.6	75.5	76		71.6	75		50-120	5		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		83		30-150
BZ 198	79		79		30-150
Benzo(b)fluoranthene-d12	85		88		30-150
DBOB	97		98		30-150
Pyrene-d10	86		89		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab ID: B567S02MNA Associated sample(s): 21-40 QC Batch ID: WG1194647-6 WG1194647-7 QC Sample: L1853052-21 Client												
Naphthalene	ND	471	371	79		414	85		50-120	11		30
Acenaphthylene	ND	471	393	84		416	86		50-120	6		30
Acenaphthene	4.42J	471	395	84		427	88		50-120	8		30
Fluorene	ND	471	413	88		468	97		50-120	12		30
Phenanthrene	16.6	471	429	88		478	95		50-120	11		30
Anthracene	7.01J	471	392	83		433	89		50-120	10		30
Fluoranthene	95.9	471	509	88		568	97		50-120	11		30
Pyrene	70.5	471	450	81		519	93		50-120	14		30
Benz(a)anthracene	23.4	471	486	98		535	106		50-120	10		30
Chrysene	22.8	471	378	75		404	79		50-120	7		30
Benzo(b)fluoranthene	15.9	471	461	95		439	87		50-120	5		30
Benzo(k)fluoranthene	10.9	471	324	67		382	77		50-120	16		30
Benzo(a)pyrene	7.99J	471	375	80		416	86		50-120	10		30
Indeno(1,2,3-cd)Pyrene	ND	471	440	94		460	95		50-120	4		30
Dibenz(a,h)anthracene	ND	471	396	84		455	94		50-120	14		30
Benzo(ghi)perylene	4.30J	471	375	80		431	89		50-120	14		30
Cl2-BZ#8	ND	94.2	70.1	74		84.7	87		50-120	19		30
Cl3-BZ#18	1.66	94.2	83.2	87		94.8	96		50-120	13		30
Cl3-BZ#28	1.12	94.2	68.5	72		82.3	84		50-120	18		30
Cl4-BZ#44	0.468J	94.2	70.5	75		86.0	89		50-120	20		30
Cl4-BZ#49	0.922	94.2	60.8	64		74.6	76		50-120	20		30
Cl4-BZ#52	1.56	94.2	74.4	77		90.1	91		50-120	19		30
Cl4-BZ#66	0.493J	94.2	70.7	75		85.8	89		50-120	19		30

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab ID: B567S02MNA Associated sample(s): 21-40 QC Batch ID: WG1194647-6 WG1194647-7 QC Sample: L1853052-21 Client												
CI5-BZ#87	ND	94.2	68.5	73		83.4	86		50-120	20		30
CI5-BZ#101	0.780J	94.2	71.2	76		86.5	89		50-120	19		30
CI5-BZ#105	ND	94.2	70.9	75		81.8	84		50-120	14		30
CI5-BZ#118	0.572J	94.2	65.3	69		79.3	82		50-120	19		30
CI6-BZ#128	ND	94.2	70.7	75		85.0	88		50-120	18		30
CI6-BZ#138	0.907	94.2	71.8	75		87.5	89		50-120	20		30
CI6-BZ#153	0.782J	94.2	73.7	78		89.2	92		50-120	19		30
CI7-BZ#170	ND	94.2	73.2	78		75.4	78		50-120	3		30
CI7-BZ#180	ND	94.2	68.6	73		72.7	75		50-120	6		30
CI7-BZ#183	ND	94.2	61.1	65		73.4	76		50-120	18		30
CI7-BZ#184	ND	94.2	71.0	75		85.9	89		50-120	19		30
CI7-BZ#187	ND	94.2	75.3	80		95.1	98		50-120	23		30
CI8-BZ#195	ND	94.2	73.5	78		74.5	77		50-120	1		30
CI9-BZ#206	ND	94.2	68.0	72		71.6	74		50-120	5		30
CI10-BZ#209	ND	94.2	70.5	75		79.4	82		50-120	12		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	85		90		30-150
BZ 198	78		78		30-150
Benzo(b)fluoranthene-d12	85		86		30-150
DBOB	99		105		30-150
Pyrene-d10	89		100		30-150



Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194644-5 QC Sample: L1853052-02 Client ID: B567PREMNB						
Naphthalene	ND	ND	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Acenaphthene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Fluoranthene	5.70J	4.91J	ug/kg	NC		30
Pyrene	5.02J	ND	ug/kg	NC		30
Benz(a)anthracene	ND	ND	ug/kg	NC		30
Chrysene	ND	ND	ug/kg	NC		30
Benzo(b)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(a)pyrene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/kg	NC		30
Dibenz(a,h)anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Cl2-BZ#8	ND	ND	ug/kg	NC		30
Cl3-BZ#18	0.934J	0.682J	ug/kg	NC		30
Cl3-BZ#28	ND	ND	ug/kg	NC		30
Cl4-BZ#44	ND	ND	ug/kg	NC		30
Cl4-BZ#49	ND	ND	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194644-5 QC Sample: L1853052-02 Client ID: B567PREMNB						
CI4-BZ#52	ND	ND	ug/kg	NC		30
CI4-BZ#66	ND	ND	ug/kg	NC		30
CI5-BZ#87	ND	ND	ug/kg	NC		30
CI5-BZ#101	ND	ND	ug/kg	NC		30
CI5-BZ#105	ND	ND	ug/kg	NC		30
CI5-BZ#118	ND	ND	ug/kg	NC		30
CI6-BZ#128	ND	ND	ug/kg	NC		30
CI6-BZ#138	ND	ND	ug/kg	NC		30
CI6-BZ#153	ND	ND	ug/kg	NC		30
CI7-BZ#170	ND	ND	ug/kg	NC		30
CI7-BZ#180	ND	ND	ug/kg	NC		30
CI7-BZ#183	ND	ND	ug/kg	NC		30
CI7-BZ#184	0.489J	ND	ug/kg	NC		30
CI7-BZ#187	ND	ND	ug/kg	NC		30
CI8-BZ#195	ND	ND	ug/kg	NC		30
CI9-BZ#206	ND	ND	ug/kg	NC		30
CI10-BZ#209	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	87		90		30-150



Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194644-5 QC Sample: L1853052-02 Client ID: B567PREMNB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Pyrene-d10	96		97		30-150
Benzo(b)fluoranthene-d12	90		91		30-150
DBOB	103		104		30-150
BZ 198	80		82		30-150



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194647-5 QC Sample: L1853052-22 Client ID: B567S02MNB						
Naphthalene	ND	ND	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Acenaphthene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	14.0	14.8	ug/kg	6		30
Anthracene	6.02J	6.44J	ug/kg	NC		30
Fluoranthene	89.0	92.9	ug/kg	4		30
Pyrene	70.0	72.4	ug/kg	3		30
Benz(a)anthracene	21.0	22.7	ug/kg	8		30
Chrysene	19.3	21.8	ug/kg	12		30
Benzo(b)fluoranthene	16.4	16.5	ug/kg	1		30
Benzo(k)fluoranthene	8.86J	10.3	ug/kg	NC		30
Benzo(a)pyrene	7.76J	8.53J	ug/kg	NC		30
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/kg	NC		30
Dibenz(a,h)anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	4.90J	ug/kg	NC		30
Cl2-BZ#8	ND	ND	ug/kg	NC		30
Cl3-BZ#18	1.19	1.85	ug/kg	43	Q	30
Cl3-BZ#28	1.04	ND	ug/kg	NC		30
Cl4-BZ#44	ND	0.476J	ug/kg	NC		30
Cl4-BZ#49	0.772J	0.743J	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194647-5 QC Sample: L1853052-22 Client ID: B567S02MNB						
Cl4-BZ#52	1.35	1.47	ug/kg	9		30
Cl4-BZ#66	0.596J	0.512J	ug/kg	NC		30
Cl5-BZ#87	ND	ND	ug/kg	NC		30
Cl5-BZ#101	0.864J	0.699J	ug/kg	NC		30
Cl5-BZ#105	ND	ND	ug/kg	NC		30
Cl5-BZ#118	ND	ND	ug/kg	NC		30
Cl6-BZ#128	ND	ND	ug/kg	NC		30
Cl6-BZ#138	0.581J	0.655J	ug/kg	NC		30
Cl6-BZ#153	0.533J	0.663J	ug/kg	NC		30
Cl7-BZ#170	ND	ND	ug/kg	NC		30
Cl7-BZ#180	ND	ND	ug/kg	NC		30
Cl7-BZ#183	ND	ND	ug/kg	NC		30
Cl7-BZ#184	ND	ND	ug/kg	NC		30
Cl7-BZ#187	ND	ND	ug/kg	NC		30
Cl8-BZ#195	ND	ND	ug/kg	NC		30
Cl9-BZ#206	ND	ND	ug/kg	NC		30
Cl10-BZ#209	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		86		30-150



Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194647-5 QC Sample: L1853052-22 Client ID: B567S02MNB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Pyrene-d10	87		90		30-150
Benzo(b)fluoranthene-d12	79		85		30-150
DBOB	80		103		30-150
BZ 198	69		79		30-150



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194644-4

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	80		40-140
Fluoranthene	89		40-140
Pyrene	86		40-140
Chrysene	70		40-140
Cl3-BZ#28	63		40-140
Cl4-BZ#44	110		40-140
Cl4-BZ#49	76		40-140
Cl4-BZ#52	83		40-140
Cl4-BZ#66	100		40-140
Cl5-BZ#87	54		40-140
Cl5-BZ#101	52		40-140
Cl5-BZ#105	93		40-140
Cl5-BZ#118	82		40-140
Cl6-BZ#138	109		40-140
Cl6-BZ#153	73		40-140
Cl7-BZ#187	51		40-140
2-Methylnaphthalene-d10 (Surrogate)	85		75-125
Pyrene-d10 (Surrogate)	99		75-125
Benzo(b)fluoranthene-d12 (Surrogate)	97		75-125
DBOB (Surrogate)	101		75-125
BZ 198 (Surrogate)	83		75-125

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194647-4

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	74		40-140
Fluoranthene	82		40-140
Pyrene	79		40-140
Chrysene	66		40-140
Cl3-BZ#28	71		40-140
Cl4-BZ#44	101		40-140
Cl4-BZ#49	82		40-140
Cl4-BZ#52	101		40-140
Cl4-BZ#66	94		40-140
Cl5-BZ#87	68		40-140
Cl5-BZ#101	59		40-140
Cl5-BZ#105	93		40-140
Cl5-BZ#118	80		40-140
Cl6-BZ#138	105		40-140
Cl6-BZ#153	67		40-140
Cl7-BZ#187	56		40-140
2-Methylnaphthalene-d10 (Surrogate)	81		75-125
Pyrene-d10 (Surrogate)	87		75-125
Benzo(b)fluoranthene-d12 (Surrogate)	83		75-125
DBOB (Surrogate)	96		75-125
BZ 198 (Surrogate)	80		75-125

PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-01
 Client ID: B567PREMNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/10/19 21:40
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.990	0.990	1	A
gamma-BHC	ND		ug/kg	0.495	0.495	1	A
Heptachlor	ND		ug/kg	0.495	0.495	1	A
Aldrin	ND		ug/kg	0.495	0.495	1	A
Heptachlor epoxide	ND		ug/kg	0.990	0.990	1	B
Oxychlorane	ND		ug/kg	0.990	0.990	1	B
trans-Chlordane	ND		ug/kg	0.495	0.495	1	A
Endosulfan I	ND		ug/kg	0.495	0.495	1	A
cis-Chlordane	ND		ug/kg	0.495	0.495	1	A
trans-Nonachlor	ND		ug/kg	0.495	0.495	1	A
4,4'-DDE	ND		ug/kg	0.495	0.495	1	A
Dieldrin	ND		ug/kg	0.495	0.495	1	A
Endrin	ND		ug/kg	0.495	0.495	1	A
Endosulfan II	ND		ug/kg	0.495	0.495	1	A
4,4'-DDD	ND		ug/kg	0.495	0.495	1	A
cis-Nonachlor	ND		ug/kg	0.495	0.495	1	A
4,4'-DDT	ND		ug/kg	0.495	0.495	1	A
Methoxychlor	ND		ug/kg	1.98	1.98	1	A
Toxaphene	ND		ug/kg	24.8	24.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	87		30-150	B
BZ 198	122		30-150	B
DBOB	93		30-150	A
BZ 198	81		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-02
 Client ID: B567PREMNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/10/19 23:22
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.938	0.938	1	A
gamma-BHC	ND		ug/kg	0.469	0.469	1	A
Heptachlor	ND		ug/kg	0.469	0.469	1	B
Aldrin	ND		ug/kg	0.469	0.469	1	B
Heptachlor epoxide	ND		ug/kg	0.938	0.938	1	B
Oxychlorane	ND		ug/kg	0.938	0.938	1	B
trans-Chlordane	ND		ug/kg	0.469	0.469	1	A
Endosulfan I	ND		ug/kg	0.469	0.469	1	A
cis-Chlordane	ND		ug/kg	0.469	0.469	1	B
trans-Nonachlor	ND		ug/kg	0.469	0.469	1	B
4,4'-DDE	ND		ug/kg	0.469	0.469	1	A
Dieldrin	ND		ug/kg	0.469	0.469	1	A
Endrin	ND		ug/kg	0.469	0.469	1	A
Endosulfan II	ND		ug/kg	0.469	0.469	1	A
4,4'-DDD	ND		ug/kg	0.469	0.469	1	A
cis-Nonachlor	ND		ug/kg	0.469	0.469	1	A
4,4'-DDT	ND		ug/kg	0.469	0.469	1	B
Methoxychlor	ND		ug/kg	1.88	1.88	1	A
Toxaphene	ND		ug/kg	23.5	23.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	83		30-150	B
BZ 198	83		30-150	B
DBOB	91		30-150	A
BZ 198	71		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-03
 Client ID: B567PREMNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 00:30
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.906	0.906	1	A
gamma-BHC	ND		ug/kg	0.453	0.453	1	A
Heptachlor	ND		ug/kg	0.453	0.453	1	A
Aldrin	ND		ug/kg	0.453	0.453	1	A
Heptachlor epoxide	ND		ug/kg	0.906	0.906	1	B
Oxychlorane	ND		ug/kg	0.906	0.906	1	B
trans-Chlordane	ND		ug/kg	0.453	0.453	1	A
Endosulfan I	ND		ug/kg	0.453	0.453	1	A
cis-Chlordane	ND		ug/kg	0.453	0.453	1	A
trans-Nonachlor	ND		ug/kg	0.453	0.453	1	A
4,4'-DDE	ND		ug/kg	0.453	0.453	1	A
Dieldrin	ND		ug/kg	0.453	0.453	1	A
Endrin	ND		ug/kg	0.453	0.453	1	A
Endosulfan II	ND		ug/kg	0.453	0.453	1	A
4,4'-DDD	ND		ug/kg	0.453	0.453	1	A
cis-Nonachlor	ND		ug/kg	0.453	0.453	1	A
4,4'-DDT	ND		ug/kg	0.453	0.453	1	A
Methoxychlor	ND		ug/kg	1.81	1.81	1	A
Toxaphene	ND		ug/kg	22.7	22.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	88		30-150	B
BZ 198	140		30-150	B
DBOB	94		30-150	A
BZ 198	72		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-11
 Client ID: B567R01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 01:04
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.975	0.975	1	A
gamma-BHC	ND		ug/kg	0.487	0.487	1	A
Heptachlor	ND		ug/kg	0.487	0.487	1	A
Aldrin	ND		ug/kg	0.487	0.487	1	A
Heptachlor epoxide	ND		ug/kg	0.975	0.975	1	B
Oxychlorane	ND		ug/kg	0.975	0.975	1	B
trans-Chlordane	ND		ug/kg	0.487	0.487	1	A
Endosulfan I	ND		ug/kg	0.487	0.487	1	A
cis-Chlordane	ND		ug/kg	0.487	0.487	1	A
trans-Nonachlor	ND		ug/kg	0.487	0.487	1	A
4,4'-DDE	0.497		ug/kg	0.487	0.487	1	A
Dieldrin	ND		ug/kg	0.487	0.487	1	A
Endrin	ND		ug/kg	0.487	0.487	1	A
Endosulfan II	ND		ug/kg	0.487	0.487	1	A
4,4'-DDD	ND		ug/kg	0.487	0.487	1	A
cis-Nonachlor	ND		ug/kg	0.487	0.487	1	A
4,4'-DDT	ND		ug/kg	0.487	0.487	1	A
Methoxychlor	ND		ug/kg	1.95	1.95	1	A
Toxaphene	ND		ug/kg	24.5	24.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	84		30-150	B
BZ 198	85		30-150	B
DBOB	91		30-150	A
BZ 198	78		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-12
 Client ID: B567R01MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 01:38
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.956	0.956	1	A
gamma-BHC	ND		ug/kg	0.478	0.478	1	A
Heptachlor	ND		ug/kg	0.478	0.478	1	A
Aldrin	ND		ug/kg	0.478	0.478	1	A
Heptachlor epoxide	ND		ug/kg	0.956	0.956	1	B
Oxychlordane	ND		ug/kg	0.956	0.956	1	B
trans-Chlordane	ND		ug/kg	0.478	0.478	1	A
Endosulfan I	ND		ug/kg	0.478	0.478	1	A
cis-Chlordane	ND		ug/kg	0.478	0.478	1	A
trans-Nonachlor	ND		ug/kg	0.478	0.478	1	A
4,4'-DDE	ND		ug/kg	0.478	0.478	1	A
Dieldrin	ND		ug/kg	0.478	0.478	1	A
Endrin	ND		ug/kg	0.478	0.478	1	A
Endosulfan II	ND		ug/kg	0.478	0.478	1	A
4,4'-DDD	ND		ug/kg	0.478	0.478	1	A
cis-Nonachlor	ND		ug/kg	0.478	0.478	1	A
4,4'-DDT	ND		ug/kg	0.478	0.478	1	A
Methoxychlor	ND		ug/kg	1.91	1.91	1	A
Toxaphene	ND		ug/kg	24.0	24.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	B
BZ 198	87		30-150	B
DBOB	98		30-150	A
BZ 198	81		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-13
 Client ID: B567R01MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 02:12
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.853	0.853	1	A
gamma-BHC	ND		ug/kg	0.427	0.427	1	A
Heptachlor	ND		ug/kg	0.427	0.427	1	A
Aldrin	ND		ug/kg	0.427	0.427	1	A
Heptachlor epoxide	ND		ug/kg	0.853	0.853	1	B
Oxychlorane	ND		ug/kg	0.853	0.853	1	B
trans-Chlordane	ND		ug/kg	0.427	0.427	1	A
Endosulfan I	ND		ug/kg	0.427	0.427	1	A
cis-Chlordane	ND		ug/kg	0.427	0.427	1	A
trans-Nonachlor	ND		ug/kg	0.427	0.427	1	A
4,4'-DDE	ND		ug/kg	0.427	0.427	1	A
Dieldrin	ND		ug/kg	0.427	0.427	1	A
Endrin	ND		ug/kg	0.427	0.427	1	A
Endosulfan II	ND		ug/kg	0.427	0.427	1	A
4,4'-DDD	ND		ug/kg	0.427	0.427	1	A
cis-Nonachlor	ND		ug/kg	0.427	0.427	1	A
4,4'-DDT	ND		ug/kg	0.427	0.427	1	A
Methoxychlor	ND		ug/kg	1.71	1.71	1	A
Toxaphene	ND		ug/kg	21.4	21.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	84		30-150	B
BZ 198	81		30-150	B
DBOB	91		30-150	A
BZ 198	75		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-14
 Client ID: B567R01MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 02:46
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.870	0.870	1	A
gamma-BHC	ND		ug/kg	0.435	0.435	1	A
Heptachlor	ND		ug/kg	0.435	0.435	1	A
Aldrin	ND		ug/kg	0.435	0.435	1	A
Heptachlor epoxide	ND		ug/kg	0.870	0.870	1	B
Oxychlordane	ND		ug/kg	0.870	0.870	1	B
trans-Chlordane	ND		ug/kg	0.435	0.435	1	A
Endosulfan I	ND		ug/kg	0.435	0.435	1	A
cis-Chlordane	ND		ug/kg	0.435	0.435	1	A
trans-Nonachlor	ND		ug/kg	0.435	0.435	1	A
4,4'-DDE	0.439	P	ug/kg	0.435	0.435	1	A
Dieldrin	ND		ug/kg	0.435	0.435	1	A
Endrin	ND		ug/kg	0.435	0.435	1	A
Endosulfan II	ND		ug/kg	0.435	0.435	1	A
4,4'-DDD	ND		ug/kg	0.435	0.435	1	A
cis-Nonachlor	ND		ug/kg	0.435	0.435	1	A
4,4'-DDT	ND		ug/kg	0.435	0.435	1	A
Methoxychlor	ND		ug/kg	1.74	1.74	1	A
Toxaphene	ND		ug/kg	21.8	21.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	88		30-150	B
BZ 198	82		30-150	B
DBOB	90		30-150	A
BZ 198	75		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-15
 Client ID: B567R01MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 03:20
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.978	0.978	1	A
gamma-BHC	ND		ug/kg	0.489	0.489	1	A
Heptachlor	ND		ug/kg	0.489	0.489	1	A
Aldrin	ND		ug/kg	0.489	0.489	1	A
Heptachlor epoxide	ND		ug/kg	0.978	0.978	1	B
Oxychlordan	ND		ug/kg	0.978	0.978	1	B
trans-Chlordane	ND		ug/kg	0.489	0.489	1	A
Endosulfan I	ND		ug/kg	0.489	0.489	1	A
cis-Chlordane	ND		ug/kg	0.489	0.489	1	A
trans-Nonachlor	ND		ug/kg	0.489	0.489	1	A
4,4'-DDE	ND		ug/kg	0.489	0.489	1	A
Dieldrin	ND		ug/kg	0.489	0.489	1	A
Endrin	ND		ug/kg	0.489	0.489	1	A
Endosulfan II	ND		ug/kg	0.489	0.489	1	A
4,4'-DDD	ND		ug/kg	0.489	0.489	1	A
cis-Nonachlor	ND		ug/kg	0.489	0.489	1	A
4,4'-DDT	ND		ug/kg	0.489	0.489	1	A
Methoxychlor	ND		ug/kg	1.96	1.96	1	A
Toxaphene	ND		ug/kg	24.6	24.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	77		30-150	B
BZ 198	76		30-150	B
DBOB	88		30-150	A
BZ 198	71		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-16
 Client ID: B567S01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 03:54
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.888	0.888	1	A
gamma-BHC	ND		ug/kg	0.444	0.444	1	A
Heptachlor	ND		ug/kg	0.444	0.444	1	A
Aldrin	ND		ug/kg	0.444	0.444	1	A
Heptachlor epoxide	ND		ug/kg	0.888	0.888	1	B
Oxychlordane	ND		ug/kg	0.888	0.888	1	B
trans-Chlordane	ND		ug/kg	0.444	0.444	1	A
Endosulfan I	ND		ug/kg	0.444	0.444	1	A
cis-Chlordane	ND		ug/kg	0.444	0.444	1	A
trans-Nonachlor	ND		ug/kg	0.444	0.444	1	A
4,4'-DDE	0.665		ug/kg	0.444	0.444	1	B
Dieldrin	ND		ug/kg	0.444	0.444	1	A
Endrin	ND		ug/kg	0.444	0.444	1	A
Endosulfan II	ND		ug/kg	0.444	0.444	1	A
4,4'-DDD	ND		ug/kg	0.444	0.444	1	A
cis-Nonachlor	ND		ug/kg	0.444	0.444	1	A
4,4'-DDT	ND		ug/kg	0.444	0.444	1	A
Methoxychlor	ND		ug/kg	1.78	1.78	1	A
Toxaphene	ND		ug/kg	22.3	22.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	82		30-150	B
BZ 198	79		30-150	B
DBOB	85		30-150	A
BZ 198	70		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-17
 Client ID: B567S01MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 04:28
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.898	0.898	1	A
gamma-BHC	ND		ug/kg	0.449	0.449	1	A
Heptachlor	ND		ug/kg	0.449	0.449	1	A
Aldrin	ND		ug/kg	0.449	0.449	1	A
Heptachlor epoxide	ND		ug/kg	0.898	0.898	1	B
Oxychlorane	ND		ug/kg	0.898	0.898	1	B
trans-Chlordane	ND		ug/kg	0.449	0.449	1	A
Endosulfan I	ND		ug/kg	0.449	0.449	1	A
cis-Chlordane	ND		ug/kg	0.449	0.449	1	A
trans-Nonachlor	ND		ug/kg	0.449	0.449	1	A
4,4'-DDE	0.814		ug/kg	0.449	0.449	1	A
Dieldrin	ND		ug/kg	0.449	0.449	1	A
Endrin	ND		ug/kg	0.449	0.449	1	A
Endosulfan II	ND		ug/kg	0.449	0.449	1	B
4,4'-DDD	ND		ug/kg	0.449	0.449	1	B
cis-Nonachlor	ND		ug/kg	0.449	0.449	1	A
4,4'-DDT	ND		ug/kg	0.449	0.449	1	A
Methoxychlor	ND		ug/kg	1.80	1.80	1	A
Toxaphene	ND		ug/kg	22.5	22.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	65		30-150	B
BZ 198	64		30-150	B
DBOB	69		30-150	A
BZ 198	59		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-18
 Client ID: B567S01MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 05:02
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.980	0.980	1	A
gamma-BHC	ND		ug/kg	0.490	0.490	1	A
Heptachlor	ND		ug/kg	0.490	0.490	1	A
Aldrin	ND		ug/kg	0.490	0.490	1	A
Heptachlor epoxide	ND		ug/kg	0.980	0.980	1	B
Oxychlordane	ND		ug/kg	0.980	0.980	1	B
trans-Chlordane	ND		ug/kg	0.490	0.490	1	A
Endosulfan I	ND		ug/kg	0.490	0.490	1	A
cis-Chlordane	ND		ug/kg	0.490	0.490	1	B
trans-Nonachlor	ND		ug/kg	0.490	0.490	1	A
4,4'-DDE	0.776		ug/kg	0.490	0.490	1	A
Dieldrin	ND		ug/kg	0.490	0.490	1	A
Endrin	ND		ug/kg	0.490	0.490	1	A
Endosulfan II	ND		ug/kg	0.490	0.490	1	B
4,4'-DDD	ND		ug/kg	0.490	0.490	1	A
cis-Nonachlor	ND		ug/kg	0.490	0.490	1	A
4,4'-DDT	ND		ug/kg	0.490	0.490	1	A
Methoxychlor	ND		ug/kg	1.96	1.96	1	A
Toxaphene	ND		ug/kg	24.6	24.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	81		30-150	B
BZ 198	79		30-150	B
DBOB	91		30-150	A
BZ 198	75		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-19
 Client ID: B567S01MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 05:36
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.874	0.874	1	A
gamma-BHC	ND		ug/kg	0.437	0.437	1	A
Heptachlor	ND		ug/kg	0.437	0.437	1	A
Aldrin	ND		ug/kg	0.437	0.437	1	A
Heptachlor epoxide	ND		ug/kg	0.874	0.874	1	B
Oxychlorane	1.23		ug/kg	0.874	0.874	1	B
trans-Chlordane	ND		ug/kg	0.437	0.437	1	A
Endosulfan I	ND		ug/kg	0.437	0.437	1	A
cis-Chlordane	ND		ug/kg	0.437	0.437	1	A
trans-Nonachlor	ND		ug/kg	0.437	0.437	1	A
4,4'-DDE	0.642		ug/kg	0.437	0.437	1	A
Dieldrin	ND		ug/kg	0.437	0.437	1	A
Endrin	ND		ug/kg	0.437	0.437	1	A
Endosulfan II	ND		ug/kg	0.437	0.437	1	B
4,4'-DDD	ND		ug/kg	0.437	0.437	1	A
cis-Nonachlor	ND		ug/kg	0.437	0.437	1	A
4,4'-DDT	ND		ug/kg	0.437	0.437	1	A
Methoxychlor	ND		ug/kg	1.75	1.75	1	A
Toxaphene	ND		ug/kg	21.9	21.9	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	92		30-150	B
BZ 198	75		30-150	B
DBOB	93		30-150	A
BZ 198	68		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-20
 Client ID: B567S01MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 06:09
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.965	0.965	1	A
gamma-BHC	ND		ug/kg	0.483	0.483	1	A
Heptachlor	ND		ug/kg	0.483	0.483	1	A
Aldrin	ND		ug/kg	0.483	0.483	1	A
Heptachlor epoxide	ND		ug/kg	0.965	0.965	1	B
Oxychlorane	ND		ug/kg	0.965	0.965	1	B
trans-Chlordane	ND		ug/kg	0.483	0.483	1	A
Endosulfan I	ND		ug/kg	0.483	0.483	1	A
cis-Chlordane	ND		ug/kg	0.483	0.483	1	A
trans-Nonachlor	ND		ug/kg	0.483	0.483	1	A
4,4'-DDE	0.742		ug/kg	0.483	0.483	1	A
Dieldrin	ND		ug/kg	0.483	0.483	1	A
Endrin	ND		ug/kg	0.483	0.483	1	A
Endosulfan II	ND		ug/kg	0.483	0.483	1	B
4,4'-DDD	ND		ug/kg	0.483	0.483	1	A
cis-Nonachlor	ND		ug/kg	0.483	0.483	1	A
4,4'-DDT	ND		ug/kg	0.483	0.483	1	A
Methoxychlor	ND		ug/kg	1.93	1.93	1	A
Toxaphene	ND		ug/kg	24.2	24.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	80		30-150	B
BZ 198	79		30-150	B
DBOB	88		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-21
 Client ID: B567S02MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 18:39
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.852	0.852	1	A
gamma-BHC	ND		ug/kg	0.426	0.426	1	A
Heptachlor	ND		ug/kg	0.426	0.426	1	A
Aldrin	ND		ug/kg	0.426	0.426	1	A
Heptachlor epoxide	ND		ug/kg	0.852	0.852	1	B
Oxychlordane	ND		ug/kg	0.852	0.852	1	B
trans-Chlordane	1.80	P	ug/kg	0.426	0.426	1	A
Endosulfan I	ND		ug/kg	0.426	0.426	1	A
cis-Chlordane	ND		ug/kg	0.426	0.426	1	B
trans-Nonachlor	ND		ug/kg	0.426	0.426	1	B
4,4'-DDE	0.612		ug/kg	0.426	0.426	1	A
Dieldrin	ND		ug/kg	0.426	0.426	1	A
Endrin	ND		ug/kg	0.426	0.426	1	A
Endosulfan II	ND		ug/kg	0.426	0.426	1	B
4,4'-DDD	ND		ug/kg	0.426	0.426	1	A
cis-Nonachlor	ND		ug/kg	0.426	0.426	1	A
4,4'-DDT	ND		ug/kg	0.426	0.426	1	A
Methoxychlor	ND		ug/kg	1.70	1.70	1	A
Toxaphene	ND		ug/kg	21.4	21.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	86		30-150	B
BZ 198	85		30-150	B
DBOB	90		30-150	A
BZ 198	74		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-22
 Client ID: B567S02MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 20:21
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.940	0.940	1	A
gamma-BHC	ND		ug/kg	0.470	0.470	1	A
Heptachlor	ND		ug/kg	0.470	0.470	1	A
Aldrin	ND		ug/kg	0.470	0.470	1	A
Heptachlor epoxide	ND		ug/kg	0.940	0.940	1	B
Oxychlordane	ND		ug/kg	0.940	0.940	1	B
trans-Chlordane	2.26	P	ug/kg	0.470	0.470	1	A
Endosulfan I	ND		ug/kg	0.470	0.470	1	A
cis-Chlordane	ND		ug/kg	0.470	0.470	1	A
trans-Nonachlor	ND		ug/kg	0.470	0.470	1	A
4,4'-DDE	0.597		ug/kg	0.470	0.470	1	A
Dieldrin	ND		ug/kg	0.470	0.470	1	A
Endrin	ND		ug/kg	0.470	0.470	1	A
Endosulfan II	ND		ug/kg	0.470	0.470	1	A
4,4'-DDD	ND		ug/kg	0.470	0.470	1	A
cis-Nonachlor	ND		ug/kg	0.470	0.470	1	A
4,4'-DDT	ND		ug/kg	0.470	0.470	1	A
Methoxychlor	ND		ug/kg	1.88	1.88	1	A
Toxaphene	ND		ug/kg	23.6	23.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	97		30-150	B
BZ 198	84		30-150	B
DBOB	89		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-23
 Client ID: B567S02MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 21:28
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.874	0.874	1	A
gamma-BHC	ND		ug/kg	0.437	0.437	1	A
Heptachlor	ND		ug/kg	0.437	0.437	1	A
Aldrin	ND		ug/kg	0.437	0.437	1	A
Heptachlor epoxide	ND		ug/kg	0.874	0.874	1	B
Oxychlorane	ND		ug/kg	0.874	0.874	1	B
trans-Chlordane	2.16	P	ug/kg	0.437	0.437	1	A
Endosulfan I	ND		ug/kg	0.437	0.437	1	A
cis-Chlordane	ND		ug/kg	0.437	0.437	1	A
trans-Nonachlor	ND		ug/kg	0.437	0.437	1	A
4,4'-DDE	0.802		ug/kg	0.437	0.437	1	B
Dieldrin	ND		ug/kg	0.437	0.437	1	A
Endrin	ND		ug/kg	0.437	0.437	1	A
Endosulfan II	ND		ug/kg	0.437	0.437	1	A
4,4'-DDD	ND		ug/kg	0.437	0.437	1	A
cis-Nonachlor	ND		ug/kg	0.437	0.437	1	A
4,4'-DDT	ND		ug/kg	0.437	0.437	1	A
Methoxychlor	ND		ug/kg	1.75	1.75	1	A
Toxaphene	ND		ug/kg	21.9	21.9	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	B
BZ 198	88		30-150	B
DBOB	96		30-150	A
BZ 198	79		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-24
 Client ID: B567S02MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 22:02
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.890	0.890	1	A
gamma-BHC	ND		ug/kg	0.445	0.445	1	A
Heptachlor	ND		ug/kg	0.445	0.445	1	A
Aldrin	ND		ug/kg	0.445	0.445	1	A
Heptachlor epoxide	ND		ug/kg	0.890	0.890	1	B
Oxychlorane	1.03		ug/kg	0.890	0.890	1	B
trans-Chlordane	2.07	P	ug/kg	0.445	0.445	1	A
Endosulfan I	ND		ug/kg	0.445	0.445	1	A
cis-Chlordane	ND		ug/kg	0.445	0.445	1	A
trans-Nonachlor	ND		ug/kg	0.445	0.445	1	A
4,4'-DDE	0.830		ug/kg	0.445	0.445	1	A
Dieldrin	ND		ug/kg	0.445	0.445	1	A
Endrin	ND		ug/kg	0.445	0.445	1	A
Endosulfan II	ND		ug/kg	0.445	0.445	1	A
4,4'-DDD	ND		ug/kg	0.445	0.445	1	A
cis-Nonachlor	ND		ug/kg	0.445	0.445	1	A
4,4'-DDT	ND		ug/kg	0.445	0.445	1	A
Methoxychlor	ND		ug/kg	1.78	1.78	1	A
Toxaphene	ND		ug/kg	22.3	22.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	103		30-150	B
BZ 198	84		30-150	B
DBOB	88		30-150	A
BZ 198	71		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-25
 Client ID: B567S02MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 22:36
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.885	0.885	1	A
gamma-BHC	ND		ug/kg	0.442	0.442	1	A
Heptachlor	ND		ug/kg	0.442	0.442	1	A
Aldrin	ND		ug/kg	0.442	0.442	1	A
Heptachlor epoxide	ND		ug/kg	0.885	0.885	1	B
Oxychlordane	ND		ug/kg	0.885	0.885	1	B
trans-Chlordane	2.02	P	ug/kg	0.442	0.442	1	A
Endosulfan I	ND		ug/kg	0.442	0.442	1	A
cis-Chlordane	ND		ug/kg	0.442	0.442	1	A
trans-Nonachlor	ND		ug/kg	0.442	0.442	1	A
4,4'-DDE	0.635		ug/kg	0.442	0.442	1	B
Dieldrin	ND		ug/kg	0.442	0.442	1	A
Endrin	ND		ug/kg	0.442	0.442	1	A
Endosulfan II	ND		ug/kg	0.442	0.442	1	A
4,4'-DDD	ND		ug/kg	0.442	0.442	1	A
cis-Nonachlor	ND		ug/kg	0.442	0.442	1	A
4,4'-DDT	ND		ug/kg	0.442	0.442	1	A
Methoxychlor	ND		ug/kg	1.77	1.77	1	A
Toxaphene	ND		ug/kg	22.2	22.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	97		30-150	B
BZ 198	87		30-150	B
DBOB	88		30-150	A
BZ 198	76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-26
 Client ID: B567S03MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 23:10
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.960	0.960	1	A
gamma-BHC	ND		ug/kg	0.480	0.480	1	A
Heptachlor	ND		ug/kg	0.480	0.480	1	A
Aldrin	ND		ug/kg	0.480	0.480	1	A
Heptachlor epoxide	ND		ug/kg	0.960	0.960	1	B
Oxychlorane	ND		ug/kg	0.960	0.960	1	B
trans-Chlordane	1.34	P	ug/kg	0.480	0.480	1	A
Endosulfan I	ND		ug/kg	0.480	0.480	1	A
cis-Chlordane	ND		ug/kg	0.480	0.480	1	B
trans-Nonachlor	ND		ug/kg	0.480	0.480	1	B
4,4'-DDE	0.808		ug/kg	0.480	0.480	1	B
Dieldrin	ND		ug/kg	0.480	0.480	1	A
Endrin	ND		ug/kg	0.480	0.480	1	A
Endosulfan II	ND		ug/kg	0.480	0.480	1	A
4,4'-DDD	ND		ug/kg	0.480	0.480	1	A
cis-Nonachlor	ND		ug/kg	0.480	0.480	1	A
4,4'-DDT	ND		ug/kg	0.480	0.480	1	A
Methoxychlor	ND		ug/kg	1.92	1.92	1	A
Toxaphene	ND		ug/kg	24.1	24.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	82		30-150	B
BZ 198	82		30-150	B
DBOB	85		30-150	A
BZ 198	71		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-27
 Client ID: B567S03MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/11/19 23:44
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.844	0.844	1	A
gamma-BHC	ND		ug/kg	0.422	0.422	1	A
Heptachlor	ND		ug/kg	0.422	0.422	1	A
Aldrin	ND		ug/kg	0.422	0.422	1	A
Heptachlor epoxide	ND		ug/kg	0.844	0.844	1	B
Oxychlorane	ND		ug/kg	0.844	0.844	1	B
trans-Chlordane	1.54	P	ug/kg	0.422	0.422	1	A
Endosulfan I	ND		ug/kg	0.422	0.422	1	A
cis-Chlordane	ND		ug/kg	0.422	0.422	1	A
trans-Nonachlor	ND		ug/kg	0.422	0.422	1	B
4,4'-DDE	1.03		ug/kg	0.422	0.422	1	B
Dieldrin	0.470	IP	ug/kg	0.422	0.422	1	A
Endrin	ND		ug/kg	0.422	0.422	1	A
Endosulfan II	ND		ug/kg	0.422	0.422	1	B
4,4'-DDD	0.470		ug/kg	0.422	0.422	1	A
cis-Nonachlor	ND		ug/kg	0.422	0.422	1	A
4,4'-DDT	ND		ug/kg	0.422	0.422	1	A
Methoxychlor	ND		ug/kg	1.69	1.69	1	A
Toxaphene	ND		ug/kg	21.2	21.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	84		30-150	B
BZ 198	85		30-150	B
DBOB	85		30-150	A
BZ 198	75		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-28
 Client ID: B567S03MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/12/19 00:18
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.929	0.929	1	A
gamma-BHC	ND		ug/kg	0.465	0.465	1	A
Heptachlor	ND		ug/kg	0.465	0.465	1	A
Aldrin	ND		ug/kg	0.465	0.465	1	A
Heptachlor epoxide	ND		ug/kg	0.929	0.929	1	B
Oxychlordane	ND		ug/kg	0.929	0.929	1	B
trans-Chlordane	1.46	P	ug/kg	0.465	0.465	1	A
Endosulfan I	ND		ug/kg	0.465	0.465	1	A
cis-Chlordane	ND		ug/kg	0.465	0.465	1	A
trans-Nonachlor	ND		ug/kg	0.465	0.465	1	A
4,4'-DDE	0.815		ug/kg	0.465	0.465	1	B
Dieldrin	ND		ug/kg	0.465	0.465	1	A
Endrin	ND		ug/kg	0.465	0.465	1	A
Endosulfan II	ND		ug/kg	0.465	0.465	1	B
4,4'-DDD	ND		ug/kg	0.465	0.465	1	A
cis-Nonachlor	ND		ug/kg	0.465	0.465	1	A
4,4'-DDT	ND		ug/kg	0.465	0.465	1	A
Methoxychlor	ND		ug/kg	1.86	1.86	1	A
Toxaphene	ND		ug/kg	23.3	23.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	81		30-150	B
BZ 198	81		30-150	B
DBOB	81		30-150	A
BZ 198	72		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-29
 Client ID: B567S03MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/12/19 00:52
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.926	0.926	1	A
gamma-BHC	ND		ug/kg	0.463	0.463	1	A
Heptachlor	ND		ug/kg	0.463	0.463	1	A
Aldrin	ND		ug/kg	0.463	0.463	1	A
Heptachlor epoxide	ND		ug/kg	0.926	0.926	1	B
Oxychlordane	ND		ug/kg	0.926	0.926	1	B
trans-Chlordane	1.38	P	ug/kg	0.463	0.463	1	A
Endosulfan I	ND		ug/kg	0.463	0.463	1	A
cis-Chlordane	ND		ug/kg	0.463	0.463	1	A
trans-Nonachlor	ND		ug/kg	0.463	0.463	1	A
4,4'-DDE	0.905		ug/kg	0.463	0.463	1	B
Dieldrin	ND		ug/kg	0.463	0.463	1	A
Endrin	ND		ug/kg	0.463	0.463	1	A
Endosulfan II	ND		ug/kg	0.463	0.463	1	A
4,4'-DDD	ND		ug/kg	0.463	0.463	1	A
cis-Nonachlor	ND		ug/kg	0.463	0.463	1	A
4,4'-DDT	ND		ug/kg	0.463	0.463	1	A
Methoxychlor	ND		ug/kg	1.85	1.85	1	A
Toxaphene	ND		ug/kg	23.2	23.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	86		30-150	B
BZ 198	85		30-150	B
DBOB	87		30-150	A
BZ 198	77		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-30
 Client ID: B567S03MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/12/19 01:26
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.886	0.886	1	A
gamma-BHC	ND		ug/kg	0.443	0.443	1	A
Heptachlor	ND		ug/kg	0.443	0.443	1	A
Aldrin	ND		ug/kg	0.443	0.443	1	A
Heptachlor epoxide	ND		ug/kg	0.886	0.886	1	B
Oxychlorane	ND		ug/kg	0.886	0.886	1	B
trans-Chlordane	1.58	P	ug/kg	0.443	0.443	1	A
Endosulfan I	ND		ug/kg	0.443	0.443	1	A
cis-Chlordane	ND		ug/kg	0.443	0.443	1	A
trans-Nonachlor	ND		ug/kg	0.443	0.443	1	A
4,4'-DDE	0.967		ug/kg	0.443	0.443	1	B
Dieldrin	ND		ug/kg	0.443	0.443	1	A
Endrin	ND		ug/kg	0.443	0.443	1	A
Endosulfan II	ND		ug/kg	0.443	0.443	1	A
4,4'-DDD	ND		ug/kg	0.443	0.443	1	A
cis-Nonachlor	ND		ug/kg	0.443	0.443	1	A
4,4'-DDT	ND		ug/kg	0.443	0.443	1	A
Methoxychlor	ND		ug/kg	1.77	1.77	1	A
Toxaphene	ND		ug/kg	22.2	22.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	89		30-150	B
BZ 198	88		30-150	B
DBOB	94		30-150	A
BZ 198	79		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-31
 Client ID: B567S04MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/12/19 02:00
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.973	0.973	1	A
gamma-BHC	ND		ug/kg	0.486	0.486	1	A
Heptachlor	ND		ug/kg	0.486	0.486	1	A
Aldrin	ND		ug/kg	0.486	0.486	1	A
Heptachlor epoxide	ND		ug/kg	0.973	0.973	1	B
Oxychlordane	ND		ug/kg	0.973	0.973	1	B
trans-Chlordane	0.590	P	ug/kg	0.486	0.486	1	A
Endosulfan I	ND		ug/kg	0.486	0.486	1	A
cis-Chlordane	ND		ug/kg	0.486	0.486	1	A
trans-Nonachlor	ND		ug/kg	0.486	0.486	1	A
4,4'-DDE	ND		ug/kg	0.486	0.486	1	B
Dieldrin	ND		ug/kg	0.486	0.486	1	A
Endrin	ND		ug/kg	0.486	0.486	1	A
Endosulfan II	ND		ug/kg	0.486	0.486	1	A
4,4'-DDD	ND		ug/kg	0.486	0.486	1	A
cis-Nonachlor	ND		ug/kg	0.486	0.486	1	A
4,4'-DDT	ND		ug/kg	0.486	0.486	1	A
Methoxychlor	ND		ug/kg	1.94	1.94	1	A
Toxaphene	ND		ug/kg	24.4	24.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	84		30-150	B
BZ 198	80		30-150	B
DBOB	94		30-150	A
BZ 198	73		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-32
 Client ID: B567S04MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/21/19 15:13
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.893	0.893	1	A
gamma-BHC	ND		ug/kg	0.446	0.446	1	A
Heptachlor	ND		ug/kg	0.446	0.446	1	A
Aldrin	ND		ug/kg	0.446	0.446	1	A
Heptachlor epoxide	ND		ug/kg	0.893	0.893	1	B
Oxychlordane	ND		ug/kg	0.893	0.893	1	B
trans-Chlordane	2.05	P	ug/kg	0.446	0.446	1	A
Endosulfan I	ND		ug/kg	0.446	0.446	1	A
cis-Chlordane	0.578	P	ug/kg	0.446	0.446	1	B
trans-Nonachlor	ND		ug/kg	0.446	0.446	1	A
4,4'-DDE	0.528		ug/kg	0.446	0.446	1	A
Dieldrin	ND		ug/kg	0.446	0.446	1	A
Endrin	ND		ug/kg	0.446	0.446	1	A
Endosulfan II	ND		ug/kg	0.446	0.446	1	B
4,4'-DDD	ND		ug/kg	0.446	0.446	1	A
cis-Nonachlor	ND		ug/kg	0.446	0.446	1	A
4,4'-DDT	0.533	IP	ug/kg	0.446	0.446	1	A
Methoxychlor	ND		ug/kg	1.78	1.78	1	A
Toxaphene	ND		ug/kg	22.4	22.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	98		30-150	B
BZ 198	84		30-150	B
DBOB	95		30-150	A
BZ 198	80		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-33
 Client ID: B567S04MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/21/19 15:47
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.865	0.865	1	A
gamma-BHC	ND		ug/kg	0.432	0.432	1	A
Heptachlor	ND		ug/kg	0.432	0.432	1	A
Aldrin	ND		ug/kg	0.432	0.432	1	A
Heptachlor epoxide	ND		ug/kg	0.865	0.865	1	B
Oxychlordane	ND		ug/kg	0.865	0.865	1	B
trans-Chlordane	1.00	P	ug/kg	0.432	0.432	1	A
Endosulfan I	ND		ug/kg	0.432	0.432	1	A
cis-Chlordane	ND		ug/kg	0.432	0.432	1	B
trans-Nonachlor	ND		ug/kg	0.432	0.432	1	A
4,4'-DDE	0.509		ug/kg	0.432	0.432	1	A
Dieldrin	ND		ug/kg	0.432	0.432	1	A
Endrin	ND		ug/kg	0.432	0.432	1	A
Endosulfan II	ND		ug/kg	0.432	0.432	1	A
4,4'-DDD	ND		ug/kg	0.432	0.432	1	B
cis-Nonachlor	ND		ug/kg	0.432	0.432	1	A
4,4'-DDT	ND		ug/kg	0.432	0.432	1	A
Methoxychlor	ND		ug/kg	1.73	1.73	1	A
Toxaphene	ND		ug/kg	21.7	21.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	103		30-150	B
BZ 198	90		30-150	B
DBOB	94		30-150	A
BZ 198	76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-34
 Client ID: B567S04MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 16:48
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.963	0.963	1	A
gamma-BHC	ND		ug/kg	0.482	0.482	1	A
Heptachlor	ND		ug/kg	0.482	0.482	1	A
Aldrin	ND		ug/kg	0.482	0.482	1	A
Heptachlor epoxide	ND		ug/kg	0.963	0.963	1	B
Oxychlorane	ND		ug/kg	0.963	0.963	1	B
trans-Chlordane	ND		ug/kg	0.482	0.482	1	A
Endosulfan I	ND		ug/kg	0.482	0.482	1	A
cis-Chlordane	ND		ug/kg	0.482	0.482	1	A
trans-Nonachlor	ND		ug/kg	0.482	0.482	1	A
4,4'-DDE	ND		ug/kg	0.482	0.482	1	A
Dieldrin	ND		ug/kg	0.482	0.482	1	A
Endrin	ND		ug/kg	0.482	0.482	1	A
Endosulfan II	ND		ug/kg	0.482	0.482	1	A
4,4'-DDD	ND		ug/kg	0.482	0.482	1	A
cis-Nonachlor	ND		ug/kg	0.482	0.482	1	A
4,4'-DDT	ND		ug/kg	0.482	0.482	1	A
Methoxychlor	ND		ug/kg	1.93	1.93	1	A
Toxaphene	ND		ug/kg	24.2	24.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	90		30-150	B
BZ 198	82		30-150	B
DBOB	93		30-150	A
BZ 198	77		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-35
 Client ID: B567S04MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 11:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 17:22
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.885	0.885	1	A
gamma-BHC	ND		ug/kg	0.442	0.442	1	A
Heptachlor	ND		ug/kg	0.442	0.442	1	A
Aldrin	ND		ug/kg	0.442	0.442	1	A
Heptachlor epoxide	ND		ug/kg	0.885	0.885	1	B
Oxychlordane	ND		ug/kg	0.885	0.885	1	B
trans-Chlordane	1.19	P	ug/kg	0.442	0.442	1	A
Endosulfan I	ND		ug/kg	0.442	0.442	1	A
cis-Chlordane	ND		ug/kg	0.442	0.442	1	A
trans-Nonachlor	ND		ug/kg	0.442	0.442	1	A
4,4'-DDE	ND		ug/kg	0.442	0.442	1	B
Dieldrin	ND		ug/kg	0.442	0.442	1	A
Endrin	ND		ug/kg	0.442	0.442	1	A
Endosulfan II	ND		ug/kg	0.442	0.442	1	A
4,4'-DDD	ND		ug/kg	0.442	0.442	1	A
cis-Nonachlor	ND		ug/kg	0.442	0.442	1	A
4,4'-DDT	ND		ug/kg	0.442	0.442	1	A
Methoxychlor	ND		ug/kg	1.77	1.77	1	A
Toxaphene	ND		ug/kg	22.2	22.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	90		30-150	B
BZ 198	90		30-150	B
DBOB	92		30-150	A
BZ 198	81		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-36
 Client ID: B567S05MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 17:56
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.971	0.971	1	A
gamma-BHC	ND		ug/kg	0.485	0.485	1	A
Heptachlor	ND		ug/kg	0.485	0.485	1	A
Aldrin	ND		ug/kg	0.485	0.485	1	A
Heptachlor epoxide	ND		ug/kg	0.971	0.971	1	B
Oxychlorane	ND		ug/kg	0.971	0.971	1	B
trans-Chlordane	ND		ug/kg	0.485	0.485	1	A
Endosulfan I	ND		ug/kg	0.485	0.485	1	A
cis-Chlordane	ND		ug/kg	0.485	0.485	1	A
trans-Nonachlor	ND		ug/kg	0.485	0.485	1	A
4,4'-DDE	ND		ug/kg	0.485	0.485	1	B
Dieldrin	ND		ug/kg	0.485	0.485	1	A
Endrin	ND		ug/kg	0.485	0.485	1	A
Endosulfan II	ND		ug/kg	0.485	0.485	1	A
4,4'-DDD	ND		ug/kg	0.485	0.485	1	A
cis-Nonachlor	ND		ug/kg	0.485	0.485	1	A
4,4'-DDT	ND		ug/kg	0.485	0.485	1	A
Methoxychlor	ND		ug/kg	1.94	1.94	1	A
Toxaphene	ND		ug/kg	24.4	24.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	87		30-150	B
BZ 198	81		30-150	B
DBOB	84		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-37
 Client ID: B567S05MNB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 18:30
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.978	0.978	1	A
gamma-BHC	ND		ug/kg	0.489	0.489	1	A
Heptachlor	ND		ug/kg	0.489	0.489	1	A
Aldrin	ND		ug/kg	0.489	0.489	1	A
Heptachlor epoxide	ND		ug/kg	0.978	0.978	1	B
Oxychlordane	ND		ug/kg	0.978	0.978	1	B
trans-Chlordane	ND		ug/kg	0.489	0.489	1	A
Endosulfan I	ND		ug/kg	0.489	0.489	1	A
cis-Chlordane	ND		ug/kg	0.489	0.489	1	A
trans-Nonachlor	ND		ug/kg	0.489	0.489	1	A
4,4'-DDE	ND		ug/kg	0.489	0.489	1	B
Dieldrin	ND		ug/kg	0.489	0.489	1	A
Endrin	ND		ug/kg	0.489	0.489	1	A
Endosulfan II	ND		ug/kg	0.489	0.489	1	A
4,4'-DDD	ND		ug/kg	0.489	0.489	1	A
cis-Nonachlor	ND		ug/kg	0.489	0.489	1	A
4,4'-DDT	ND		ug/kg	0.489	0.489	1	A
Methoxychlor	ND		ug/kg	1.96	1.96	1	A
Toxaphene	ND		ug/kg	24.6	24.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	91		30-150	B
BZ 198	83		30-150	B
DBOB	92		30-150	A
BZ 198	77		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-38
 Client ID: B567S05MNC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 19:04
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.888	0.888	1	A
gamma-BHC	ND		ug/kg	0.444	0.444	1	A
Heptachlor	ND		ug/kg	0.444	0.444	1	A
Aldrin	ND		ug/kg	0.444	0.444	1	A
Heptachlor epoxide	ND		ug/kg	0.888	0.888	1	B
Oxychlordane	ND		ug/kg	0.888	0.888	1	B
trans-Chlordane	ND		ug/kg	0.444	0.444	1	A
Endosulfan I	ND		ug/kg	0.444	0.444	1	A
cis-Chlordane	ND		ug/kg	0.444	0.444	1	A
trans-Nonachlor	ND		ug/kg	0.444	0.444	1	A
4,4'-DDE	ND		ug/kg	0.444	0.444	1	B
Dieldrin	ND		ug/kg	0.444	0.444	1	A
Endrin	ND		ug/kg	0.444	0.444	1	A
Endosulfan II	ND		ug/kg	0.444	0.444	1	A
4,4'-DDD	ND		ug/kg	0.444	0.444	1	A
cis-Nonachlor	ND		ug/kg	0.444	0.444	1	A
4,4'-DDT	ND		ug/kg	0.444	0.444	1	A
Methoxychlor	ND		ug/kg	1.78	1.78	1	A
Toxaphene	ND		ug/kg	22.3	22.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	89		30-150	B
BZ 198	88		30-150	B
DBOB	91		30-150	A
BZ 198	78		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

SAMPLE RESULTS

Lab ID: L1853052-39
 Client ID: B567S05MND
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 19:38
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.962	0.962	1	A
gamma-BHC	ND		ug/kg	0.481	0.481	1	A
Heptachlor	ND		ug/kg	0.481	0.481	1	A
Aldrin	ND		ug/kg	0.481	0.481	1	A
Heptachlor epoxide	ND		ug/kg	0.962	0.962	1	B
Oxychlordane	ND		ug/kg	0.962	0.962	1	B
trans-Chlordane	ND		ug/kg	0.481	0.481	1	A
Endosulfan I	ND		ug/kg	0.481	0.481	1	A
cis-Chlordane	ND		ug/kg	0.481	0.481	1	A
trans-Nonachlor	ND		ug/kg	0.481	0.481	1	A
4,4'-DDE	ND		ug/kg	0.481	0.481	1	A
Dieldrin	ND		ug/kg	0.481	0.481	1	A
Endrin	ND		ug/kg	0.481	0.481	1	A
Endosulfan II	ND		ug/kg	0.481	0.481	1	A
4,4'-DDD	ND		ug/kg	0.481	0.481	1	A
cis-Nonachlor	ND		ug/kg	0.481	0.481	1	A
4,4'-DDT	ND		ug/kg	0.481	0.481	1	A
Methoxychlor	ND		ug/kg	1.92	1.92	1	A
Toxaphene	ND		ug/kg	24.1	24.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	86		30-150	B
BZ 198	84		30-150	B
DBOB	89		30-150	A
BZ 198	74		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-40
 Client ID: B567S05MNE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 12:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Macoma
 Analytical Method: 1,8081B
 Analytical Date: 01/14/19 20:12
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.904	0.904	1	A
gamma-BHC	ND		ug/kg	0.452	0.452	1	A
Heptachlor	ND		ug/kg	0.452	0.452	1	A
Aldrin	ND		ug/kg	0.452	0.452	1	A
Heptachlor epoxide	ND		ug/kg	0.904	0.904	1	B
Oxychlorane	ND		ug/kg	0.904	0.904	1	B
trans-Chlordane	ND		ug/kg	0.452	0.452	1	A
Endosulfan I	ND		ug/kg	0.452	0.452	1	A
cis-Chlordane	ND		ug/kg	0.452	0.452	1	A
trans-Nonachlor	ND		ug/kg	0.452	0.452	1	A
4,4'-DDE	ND		ug/kg	0.452	0.452	1	B
Dieldrin	ND		ug/kg	0.452	0.452	1	A
Endrin	ND		ug/kg	0.452	0.452	1	A
Endosulfan II	ND		ug/kg	0.452	0.452	1	A
4,4'-DDD	ND		ug/kg	0.452	0.452	1	A
cis-Nonachlor	ND		ug/kg	0.452	0.452	1	A
4,4'-DDT	ND		ug/kg	0.452	0.452	1	A
Methoxychlor	ND		ug/kg	1.81	1.81	1	A
Toxaphene	ND		ug/kg	22.7	22.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	99		30-150	B
BZ 198	88		30-150	B
DBOB	101		30-150	A
BZ 198	76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
 Analytical Date: 01/10/19 19:24
 Analyst: DP

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 05:00
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194642-1						
Hexachlorobenzene	ND		ug/kg	1.00	1.00	A
gamma-BHC	ND		ug/kg	0.500	0.500	A
Heptachlor	ND		ug/kg	0.500	0.500	A
Aldrin	ND		ug/kg	0.500	0.500	A
trans-Chlordane	ND		ug/kg	0.500	0.500	A
Endosulfan I	ND		ug/kg	0.500	0.500	A
cis-Chlordane	ND		ug/kg	0.500	0.500	A
trans-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDE	ND		ug/kg	0.500	0.500	A
Dieldrin	ND		ug/kg	0.500	0.500	A
Endrin	ND		ug/kg	0.500	0.500	A
Endosulfan II	ND		ug/kg	0.500	0.500	A
4,4'-DDD	ND		ug/kg	0.500	0.500	A
cis-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDT	ND		ug/kg	0.500	0.500	A
Methoxychlor	ND		ug/kg	2.00	2.00	A
Toxaphene	ND		ug/kg	25.1	25.1	A
Heptachlor epoxide	ND		ug/kg	1.00	1.00	B
Oxychlordane	ND		ug/kg	1.00	1.00	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	82		30-150	B
BZ 198	80		30-150	B
DBOB	81		30-150	A
BZ 198	76		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
 Analytical Date: 01/11/19 16:23
 Analyst: DP

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 06:45
 Cleanup Method: EPA 3630
 Cleanup Date: 01/04/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 21-40 Batch: WG1194645-1						
Hexachlorobenzene	ND		ug/kg	1.00	1.00	A
gamma-BHC	ND		ug/kg	0.500	0.500	A
Heptachlor	ND		ug/kg	0.500	0.500	A
Aldrin	ND		ug/kg	0.500	0.500	A
trans-Chlordane	ND		ug/kg	0.500	0.500	A
Endosulfan I	ND		ug/kg	0.500	0.500	A
cis-Chlordane	ND		ug/kg	0.500	0.500	A
trans-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDE	ND		ug/kg	0.500	0.500	A
Dieldrin	ND		ug/kg	0.500	0.500	A
Endrin	ND		ug/kg	0.500	0.500	A
Endosulfan II	ND		ug/kg	0.500	0.500	A
4,4'-DDD	ND		ug/kg	0.500	0.500	A
cis-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDT	ND		ug/kg	0.500	0.500	A
Methoxychlor	ND		ug/kg	2.00	2.00	A
Toxaphene	ND		ug/kg	25.1	25.1	A
Heptachlor epoxide	ND		ug/kg	1.00	1.00	B
Oxychlordane	ND		ug/kg	1.00	1.00	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	77		30-150	B
BZ 198	83		30-150	B
DBOB	86		30-150	A
BZ 198	79		30-150	A



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194642-2 WG1194642-3									
Hexachlorobenzene	92		92		50-120	0		30	A
gamma-BHC	82		84		50-120	2		30	A
Heptachlor	85		87		50-120	2		30	A
Aldrin	88		90		50-120	2		30	A
trans-Chlordane	90		91		50-120	1		30	A
Endosulfan I	88		89		50-120	1		30	A
cis-Chlordane	88		90		50-120	2		30	A
trans-Nonachlor	85		86		50-120	1		30	A
4,4'-DDE	102		102		50-120	0		30	A
Dieldrin	99		100		50-120	1		30	A
Endrin	88		87		50-120	1		30	A
4,4'-DDD	86		87		50-120	1		30	A
cis-Nonachlor	94		95		50-120	1		30	A
4,4'-DDT	92		92		50-120	0		30	A
Methoxychlor	80		81		50-120	1		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	88		87		30-150	B
BZ 198	106		89		30-150	B
DBOB	89		91		30-150	A
BZ 198	92		86		30-150	A



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits	Column
	%Recovery	Qual	%Recovery	Qual					
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194642-2 WG1194642-3									
Heptachlor epoxide	84		84		50-120	0		30	B
Oxychlorane	87		88		50-120	1		30	B
Endosulfan II	85		87		50-120	2		30	B

Surrogate	LCS		LCSD		Acceptance Criteria	Column
	%Recovery	Qual	%Recovery	Qual		
DBOB	88		87		30-150	B
BZ 198	106		89		30-150	B
DBOB	89		91		30-150	A
BZ 198	92		86		30-150	A

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194645-2 WG1194645-3									
Hexachlorobenzene	96		90		50-120	6		30	A
gamma-BHC	86		83		50-120	4		30	A
Heptachlor	92		87		50-120	6		30	A
Aldrin	97		91		50-120	6		30	A
trans-Chlordane	99		94		50-120	5		30	A
Endosulfan I	94		89		50-120	5		30	A
cis-Chlordane	97		92		50-120	5		30	A
trans-Nonachlor	94		89		50-120	5		30	A
4,4'-DDE	113		106		50-120	6		30	A
Dieldrin	107		101		50-120	6		30	A
Endrin	92		89		50-120	3		30	A
4,4'-DDD	94		89		50-120	5		30	A
cis-Nonachlor	105		100		50-120	5		30	A
4,4'-DDT	96		92		50-120	4		30	A
Methoxychlor	72		71		50-120	1		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	86		81		30-150	B
BZ 198	95		94		30-150	B
DBOB	91		88		30-150	A
BZ 198	87		84		30-150	A



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194645-2 WG1194645-3									
Heptachlor epoxide	90		85		50-120	6		30	B
Oxychlorane	95		89		50-120	7		30	B
Endosulfan II	88		85		50-120	3		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	86		81		30-150	B
BZ 198	95		94		30-150	B
DBOB	91		88		30-150	A
BZ 198	87		84		30-150	A



Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab ID: B567PREMNA Associated sample(s): 01-03,11-20 QC Batch ID: WG1194642-6 WG1194642-7 QC Sample: L1853052-01 Client													
Hexachlorobenzene	ND	99.6	88.8	89		80.6	85		50-120	10		30	A
gamma-BHC	ND	99.6	83.8	84		78.7	83		50-120	6		30	A
Heptachlor	ND	99.6	83.2	84		77.1	81		50-120	8		30	A
Aldrin	ND	99.6	84.9	85		78.2	82		50-120	8		30	A
Heptachlor epoxide	ND	99.6	70.8	71		65.9	69		50-120	7		30	B
Oxychlorodane	ND	99.6	73.2	74		68.2	72		50-120	7		30	B
trans-Chlordane	ND	99.6	81.4	82		77.7	82		50-120	5		30	A
Endosulfan I	ND	99.6	80.6	81		77.5	82		50-120	4		30	A
cis-Chlordane	ND	99.6	75.6	76		73.7	78		50-120	3		30	A
trans-Nonachlor	ND	99.6	71.6	72		69.8	73		50-120	3		30	A
4,4'-DDE	ND	99.6	83.8	84		81.3	86		50-120	3		30	A
Dieldrin	ND	99.6	83.3	84		78.9	83		50-120	5		30	A
Endrin	ND	99.6	77.4	78		71.1	75		50-120	8		30	A
Endosulfan II	ND	99.6	76.6	77		70.1	74		50-120	9		30	B
4,4'-DDD	ND	99.6	78.3	79		72.3	76		50-120	8		30	A
cis-Nonachlor	ND	99.6	77.2	78		72.1	76		50-120	7		30	A
4,4'-DDT	ND	99.6	72.7	73		68.1	72		50-120	7		30	A
Methoxychlor	ND	99.6	67.4	68		61.1	64		50-120	10		30	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
BZ 198	76		75		30-150	B
DBOB	84		77		30-150	B



Matrix Spike Analysis**Batch Quality Control****Project Name:** NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194642-6 WG1194642-7 QC Sample: L1853052-01 Client ID: B567PREMNA

Surrogate	MS		MSD		Acceptance Criteria	Column
	% Recovery	Qualifier	% Recovery	Qualifier		
BZ 198	72		70		30-150	A
DBOB	95		80		30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>	<i>Column</i>
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194645-6 WG1194645-7 QC Sample: L1853052-21 Client ID: B567S02MNA													
Hexachlorobenzene	ND	94.2	102	108		91.4	94		50-120	11		30	A
gamma-BHC	ND	94.2	100	106		90.0	93		50-120	11		30	A
Heptachlor	ND	94.2	99.2	105		87.7	91		50-120	12		30	A
Aldrin	ND	94.2	96.6	103		86.1	89		50-120	11		30	A
Heptachlor epoxide	ND	94.2	83.7	89		76.7	79		50-120	9		30	B
Oxychlorane	ND	94.2	84.2	89		77.5	80		50-120	8		30	B
trans-Chlordane	1.80P	94.2	91.3	95		83.5	84		50-120	9		30	A
Endosulfan I	ND	94.2	91.4	97		83.8	87		50-120	9		30	A
cis-Chlordane	ND	94.2	78.6	84		72.7	75		50-120	8		30	B
trans-Nonachlor	ND	94.2	77.7	83		71.8	74		50-120	8		30	B
4,4'-DDE	0.612	94.2	99.2	105		89.8	92		50-120	10		30	A
Dieldrin	ND	94.2	99.9	106		90.8	94		50-120	10		30	A
Endrin	ND	94.2	91.8	98		85.3	88		50-120	7		30	A
Endosulfan II	ND	94.2	89.2	95		82.7	85		50-120	8		30	B
4,4'-DDD	ND	94.2	90.9	97		85.6	88		50-120	6		30	A
cis-Nonachlor	ND	94.2	92.8	99		84.2	87		50-120	10		30	A
4,4'-DDT	ND	94.2	87.4	93		80.3	83		50-120	8		30	A
Methoxychlor	ND	94.2	82.4	88		78.8	81		50-120	4		30	A

<i>Surrogate</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>	<i>Column</i>
BZ 198	92		87		30-150	B
DBOB	118		93		30-150	B

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194645-6 WG1194645-7 QC Sample: L1853052-21 Client ID: B567S02MNA												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
BZ 198	87		79		30-150	A
DBOB	114		92		30-150	A



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194642-5 QC Sample: L1853052-02 Client ID: B567PREMNB						
Hexachlorobenzene	ND	ND	ug/kg	NC		30 A
gamma-BHC	ND	ND	ug/kg	NC		30 A
Heptachlor	ND	ND	ug/kg	NC		30 B
Aldrin	ND	ND	ug/kg	NC		30 B
Heptachlor epoxide	ND	ND	ug/kg	NC		30 B
Oxychlordane	ND	ND	ug/kg	NC		30 B
trans-Chlordane	ND	ND	ug/kg	NC		30 A
Endosulfan I	ND	ND	ug/kg	NC		30 A
cis-Chlordane	ND	ND	ug/kg	NC		30 B
trans-Nonachlor	ND	ND	ug/kg	NC		30 B
4,4'-DDE	ND	ND	ug/kg	NC		30 A
Dieldrin	ND	ND	ug/kg	NC		30 A
Endrin	ND	ND	ug/kg	NC		30 A
Endosulfan II	ND	ND	ug/kg	NC		30 A
4,4'-DDD	ND	ND	ug/kg	NC		30 A
cis-Nonachlor	ND	ND	ug/kg	NC		30 A
4,4'-DDT	ND	ND	ug/kg	NC		30 B
Methoxychlor	ND	ND	ug/kg	NC		30 A
Toxaphene	ND	ND	ug/kg	NC		30 A

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194642-5 QC Sample: L1853052-02 Client ID: B567PREMNB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	83		81		30-150	B
BZ 198	83		102		30-150	B
DBOB	91		89		30-150	A
BZ 198	71		71		30-150	A

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194645-5 QC Sample: L1853052-22 Client ID: B567S02MNB						
Hexachlorobenzene	ND	ND	ug/kg	NC		30 A
gamma-BHC	ND	ND	ug/kg	NC		30 A
Heptachlor	ND	ND	ug/kg	NC		30 A
Aldrin	ND	ND	ug/kg	NC		30 A
Heptachlor epoxide	ND	ND	ug/kg	NC		30 B
Oxychlordane	ND	ND	ug/kg	NC		30 B
trans-Chlordane	2.26P	1.73P	ug/kg	27		30 A
Endosulfan I	ND	ND	ug/kg	NC		30 A
cis-Chlordane	ND	ND	ug/kg	NC		30 A
trans-Nonachlor	ND	ND	ug/kg	NC		30 A
4,4'-DDE	0.597	0.616	ug/kg	3		30 A
Dieldrin	ND	ND	ug/kg	NC		30 A
Endrin	ND	ND	ug/kg	NC		30 A
Endosulfan II	ND	ND	ug/kg	NC		30 A
4,4'-DDD	ND	ND	ug/kg	NC		30 A
cis-Nonachlor	ND	ND	ug/kg	NC		30 A
4,4'-DDT	ND	ND	ug/kg	NC		30 A
Methoxychlor	ND	ND	ug/kg	NC		30 A
Toxaphene	ND	ND	ug/kg	NC		30 A

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194645-5 QC Sample: L1853052-22 Client ID: B567S02MNB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	97		90		30-150	B
BZ 198	84		86		30-150	B
DBOB	89		91		30-150	A
BZ 198	73		76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194642-4

Parameter	% Recovery	Qual	QC Criteria
cis-Chlordane	70		40-140
4,4'-DDE	74		40-140
4,4'-DDD	92		40-140
DBOB (Surrogate)	97		30-150
DBOB (Surrogate)	102		30-150
BZ 198 (Surrogate)	79		30-150
BZ 198 (Surrogate)	84		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194645-4

Parameter	% Recovery	Qual	QC Criteria
cis-Chlordane	79		40-140
4,4'-DDE	82		40-140
4,4'-DDD	98		40-140
DBOB (Surrogate)	86		30-150
DBOB (Surrogate)	90		30-150
BZ 198 (Surrogate)	76		30-150
BZ 198 (Surrogate)	81		30-150

METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-01

Date Collected: 12/21/18 10:15

Client ID: B567PREMNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.76		mg/kg	0.086	0.029	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.034	0.009	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Chromium, Total	0.461		mg/kg	0.342	0.031	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Copper, Total	1.50		mg/kg	0.086	0.029	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Lead, Total	0.274		mg/kg	0.034	0.005	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.011	0.003	5	01/04/19 11:40	01/05/19 16:03	EPA 7474	1,7474	BV
Nickel, Total	0.378		mg/kg	0.086	0.032	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM
Zinc, Total	11.1		mg/kg	0.855	0.127	2	01/04/19 11:40	01/09/19 15:46	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-02

Date Collected: 12/21/18 10:15

Client ID: B567PREMNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.97		mg/kg	0.095	0.033	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Cadmium, Total	0.031	J	mg/kg	0.038	0.010	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Chromium, Total	0.500		mg/kg	0.381	0.034	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Copper, Total	1.75		mg/kg	0.095	0.032	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Lead, Total	0.296		mg/kg	0.038	0.006	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.012	0.003	5	01/04/19 11:40	01/05/19 16:20	EPA 7474	1,7474	BV
Nickel, Total	0.413		mg/kg	0.095	0.035	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM
Zinc, Total	9.86		mg/kg	0.952	0.142	2	01/04/19 11:40	01/09/19 16:51	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-03

Date Collected: 12/21/18 10:15

Client ID: B567PREMNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.72		mg/kg	0.090	0.031	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Cadmium, Total	0.025	J	mg/kg	0.036	0.009	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Chromium, Total	0.433		mg/kg	0.360	0.032	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Copper, Total	1.54		mg/kg	0.090	0.030	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Lead, Total	0.260		mg/kg	0.036	0.005	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/04/19 11:40	01/05/19 16:25	EPA 7474	1,7474	BV
Nickel, Total	0.349		mg/kg	0.090	0.034	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM
Zinc, Total	8.26		mg/kg	0.901	0.134	2	01/04/19 11:40	01/09/19 16:55	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-11

Date Collected: 12/21/18 09:30

Client ID: B567R01MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.78		mg/kg	0.088	0.030	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.035	0.009	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Chromium, Total	0.393		mg/kg	0.351	0.032	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Copper, Total	1.96		mg/kg	0.088	0.029	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Lead, Total	0.410		mg/kg	0.035	0.005	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.011	0.003	5	01/04/19 11:40	01/05/19 16:28	EPA 7474	1,7474	BV
Nickel, Total	0.422		mg/kg	0.088	0.033	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM
Zinc, Total	10.5		mg/kg	0.877	0.131	2	01/04/19 11:40	01/09/19 17:00	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-12

Date Collected: 12/21/18 09:30

Client ID: B567R01MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.10		mg/kg	0.089	0.030	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.035	0.009	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Chromium, Total	0.439		mg/kg	0.354	0.032	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Copper, Total	1.75		mg/kg	0.089	0.030	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Lead, Total	0.419		mg/kg	0.035	0.005	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Mercury, Total	0.005	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:30	EPA 7474	1,7474	BV
Nickel, Total	0.440		mg/kg	0.089	0.033	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM
Zinc, Total	8.31		mg/kg	0.885	0.132	2	01/04/19 13:00	01/09/19 17:04	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-13

Date Collected: 12/21/18 09:30

Client ID: B567R01MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.94		mg/kg	0.093	0.032	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.037	0.010	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Chromium, Total	0.314	J	mg/kg	0.374	0.034	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Copper, Total	1.96		mg/kg	0.093	0.031	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Lead, Total	0.370		mg/kg	0.037	0.005	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Mercury, Total	0.005	J	mg/kg	0.012	0.003	5	01/04/19 13:00	01/05/19 16:33	EPA 7474	1,7474	BV
Nickel, Total	0.318		mg/kg	0.093	0.035	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM
Zinc, Total	10.2		mg/kg	0.934	0.139	2	01/04/19 13:00	01/09/19 17:09	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-14

Date Collected: 12/21/18 09:30

Client ID: B567R01MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.62		mg/kg	0.089	0.030	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Cadmium, Total	0.026	J	mg/kg	0.035	0.009	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Chromium, Total	0.676		mg/kg	0.354	0.032	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Copper, Total	1.90		mg/kg	0.089	0.030	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Lead, Total	0.542		mg/kg	0.035	0.005	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:35	EPA 7474	1,7474	BV
Nickel, Total	0.484		mg/kg	0.089	0.033	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM
Zinc, Total	10.1		mg/kg	0.885	0.132	2	01/04/19 13:00	01/09/19 17:13	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-15

Date Collected: 12/21/18 09:30

Client ID: B567R01MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.29		mg/kg	0.086	0.029	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Cadmium, Total	0.020	J	mg/kg	0.034	0.009	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Chromium, Total	0.610		mg/kg	0.342	0.031	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Copper, Total	2.05		mg/kg	0.086	0.029	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Lead, Total	0.564		mg/kg	0.034	0.005	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:38	EPA 7474	1,7474	BV
Nickel, Total	0.442		mg/kg	0.086	0.032	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM
Zinc, Total	8.13		mg/kg	0.855	0.127	2	01/04/19 13:00	01/09/19 17:18	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-16

Date Collected: 12/21/18 10:30

Client ID: B567S01MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.90		mg/kg	0.085	0.029	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Cadmium, Total	0.024	J	mg/kg	0.034	0.009	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Chromium, Total	0.452		mg/kg	0.339	0.031	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Copper, Total	1.98		mg/kg	0.085	0.028	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Lead, Total	0.425		mg/kg	0.034	0.005	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:40	EPA 7474	1,7474	BV
Nickel, Total	0.285		mg/kg	0.085	0.032	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM
Zinc, Total	7.63		mg/kg	0.847	0.126	2	01/04/19 13:00	01/09/19 17:46	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-17

Date Collected: 12/21/18 10:30

Client ID: B567S01MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.85		mg/kg	0.083	0.028	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.033	0.009	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Chromium, Total	0.402		mg/kg	0.330	0.030	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Copper, Total	2.16		mg/kg	0.083	0.028	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Lead, Total	0.419		mg/kg	0.033	0.005	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.010	0.003	5	01/04/19 13:00	01/05/19 16:49	EPA 7474	1,7474	BV
Nickel, Total	0.324		mg/kg	0.083	0.031	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM
Zinc, Total	11.2		mg/kg	0.826	0.123	2	01/04/19 13:00	01/09/19 17:50	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-18

Date Collected: 12/21/18 10:30

Client ID: B567S01MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.92		mg/kg	0.085	0.029	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Cadmium, Total	0.031	J	mg/kg	0.034	0.009	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Chromium, Total	0.550		mg/kg	0.339	0.031	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Copper, Total	1.96		mg/kg	0.085	0.028	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Lead, Total	0.622		mg/kg	0.034	0.005	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:51	EPA 7474	1,7474	BV
Nickel, Total	0.374		mg/kg	0.085	0.032	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM
Zinc, Total	10.2		mg/kg	0.847	0.126	2	01/04/19 13:00	01/09/19 17:55	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-19

Date Collected: 12/21/18 10:30

Client ID: B567S01MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.23		mg/kg	0.088	0.030	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Cadmium, Total	0.033	J	mg/kg	0.035	0.009	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Chromium, Total	0.446		mg/kg	0.351	0.032	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Copper, Total	2.22		mg/kg	0.088	0.029	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Lead, Total	0.331		mg/kg	0.035	0.005	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:54	EPA 7474	1,7474	BV
Nickel, Total	0.281		mg/kg	0.088	0.033	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM
Zinc, Total	9.41		mg/kg	0.877	0.131	2	01/04/19 13:00	01/09/19 17:59	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-20

Date Collected: 12/21/18 10:30

Client ID: B567S01MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.46		mg/kg	0.089	0.031	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Cadmium, Total	0.032	J	mg/kg	0.036	0.009	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Chromium, Total	0.506		mg/kg	0.357	0.032	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Copper, Total	1.99		mg/kg	0.089	0.030	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Lead, Total	0.446		mg/kg	0.036	0.005	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.011	0.003	5	01/04/19 13:00	01/05/19 16:56	EPA 7474	1,7474	BV
Nickel, Total	0.418		mg/kg	0.089	0.033	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM
Zinc, Total	10.7		mg/kg	0.893	0.133	2	01/04/19 13:00	01/09/19 18:48	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-21

Date Collected: 12/21/18 10:45

Client ID: B567S02MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.25		mg/kg	0.095	0.033	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Cadmium, Total	0.025	J	mg/kg	0.038	0.010	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Chromium, Total	0.363	J	mg/kg	0.381	0.034	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Copper, Total	2.01		mg/kg	0.095	0.032	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Lead, Total	0.399		mg/kg	0.038	0.006	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 15:15	01/09/19 12:07	EPA 7474	1,7474	BV
Nickel, Total	0.329		mg/kg	0.095	0.035	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM
Zinc, Total	10.5		mg/kg	0.952	0.142	2	01/04/19 15:15	01/14/19 15:59	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-22

Date Collected: 12/21/18 10:45

Client ID: B567S02MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.03		mg/kg	0.089	0.030	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Cadmium, Total	0.022	J	mg/kg	0.035	0.009	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Chromium, Total	0.355		mg/kg	0.354	0.032	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Copper, Total	2.07		mg/kg	0.089	0.030	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Lead, Total	0.384		mg/kg	0.035	0.005	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/04/19 15:15	01/09/19 12:14	EPA 7474	1,7474	BV
Nickel, Total	0.350		mg/kg	0.089	0.033	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM
Zinc, Total	8.67		mg/kg	0.885	0.132	2	01/04/19 15:15	01/14/19 15:54	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-23

Date Collected: 12/21/18 10:45

Client ID: B567S02MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.40		mg/kg	0.089	0.031	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Cadmium, Total	0.038		mg/kg	0.036	0.009	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Chromium, Total	0.509		mg/kg	0.357	0.032	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Copper, Total	2.32		mg/kg	0.089	0.030	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Lead, Total	0.470		mg/kg	0.036	0.005	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.011	0.003	5	01/04/19 15:15	01/09/19 12:26	EPA 7474	1,7474	BV
Nickel, Total	0.438		mg/kg	0.089	0.033	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM
Zinc, Total	13.6		mg/kg	0.893	0.133	2	01/04/19 15:15	01/14/19 16:50	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-24

Date Collected: 12/21/18 10:45

Client ID: B567S02MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.66		mg/kg	0.084	0.029	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.034	0.009	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Chromium, Total	0.419		mg/kg	0.336	0.030	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Copper, Total	2.04		mg/kg	0.084	0.028	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Lead, Total	0.442		mg/kg	0.034	0.005	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/04/19 15:15	01/09/19 12:29	EPA 7474	1,7474	BV
Nickel, Total	0.350		mg/kg	0.084	0.031	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM
Zinc, Total	10.6		mg/kg	0.840	0.125	2	01/04/19 15:15	01/14/19 16:55	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-25

Date Collected: 12/21/18 10:45

Client ID: B567S02MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.21		mg/kg	0.094	0.032	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.038	0.010	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Chromium, Total	0.273	J	mg/kg	0.377	0.034	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Copper, Total	1.93		mg/kg	0.094	0.032	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Lead, Total	0.294		mg/kg	0.038	0.005	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 12:31	EPA 7474	1,7474	BV
Nickel, Total	0.315		mg/kg	0.094	0.035	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM
Zinc, Total	10.3		mg/kg	0.943	0.140	2	01/04/19 18:20	01/14/19 16:59	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-26

Date Collected: 12/21/18 11:15

Client ID: B567S03MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.78		mg/kg	0.084	0.029	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.034	0.009	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Chromium, Total	0.392		mg/kg	0.336	0.030	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Copper, Total	2.18		mg/kg	0.084	0.028	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Lead, Total	0.351		mg/kg	0.034	0.005	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 12:34	EPA 7474	1,7474	BV
Nickel, Total	0.260		mg/kg	0.084	0.031	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM
Zinc, Total	8.02		mg/kg	0.840	0.125	2	01/04/19 18:20	01/14/19 17:04	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-27

Date Collected: 12/21/18 11:15

Client ID: B567S03MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.25		mg/kg	0.089	0.030	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Cadmium, Total	0.024	J	mg/kg	0.035	0.009	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Chromium, Total	0.410		mg/kg	0.354	0.032	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Copper, Total	1.94		mg/kg	0.089	0.030	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Lead, Total	0.371		mg/kg	0.035	0.005	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 12:36	EPA 7474	1,7474	BV
Nickel, Total	0.350		mg/kg	0.089	0.033	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM
Zinc, Total	10.4		mg/kg	0.885	0.132	2	01/04/19 18:20	01/14/19 17:08	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-28

Date Collected: 12/21/18 11:15

Client ID: B567S03MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.89		mg/kg	0.095	0.033	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.038	0.010	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Chromium, Total	0.591		mg/kg	0.381	0.034	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Copper, Total	2.55		mg/kg	0.095	0.032	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Lead, Total	0.451		mg/kg	0.038	0.006	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 12:39	EPA 7474	1,7474	BV
Nickel, Total	0.405		mg/kg	0.095	0.035	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM
Zinc, Total	8.94		mg/kg	0.952	0.142	2	01/04/19 18:20	01/14/19 17:13	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-29

Date Collected: 12/21/18 11:15

Client ID: B567S03MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.40		mg/kg	0.092	0.032	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Cadmium, Total	0.022	J	mg/kg	0.037	0.010	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Chromium, Total	0.416		mg/kg	0.367	0.033	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Copper, Total	2.04		mg/kg	0.092	0.031	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Lead, Total	0.371		mg/kg	0.037	0.005	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 12:41	EPA 7474	1,7474	BV
Nickel, Total	0.285		mg/kg	0.092	0.034	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM
Zinc, Total	7.70		mg/kg	0.917	0.137	2	01/04/19 18:20	01/14/19 17:17	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-30

Date Collected: 12/21/18 11:15

Client ID: B567S03MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.88		mg/kg	0.086	0.029	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.034	0.009	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Chromium, Total	0.513		mg/kg	0.342	0.031	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Copper, Total	2.24		mg/kg	0.086	0.029	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Lead, Total	0.444		mg/kg	0.034	0.005	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 12:43	EPA 7474	1,7474	BV
Nickel, Total	0.362		mg/kg	0.086	0.032	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM
Zinc, Total	10.4		mg/kg	0.855	0.127	2	01/04/19 18:20	01/14/19 17:22	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-31

Date Collected: 12/21/18 11:15

Client ID: B567S04MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.94		mg/kg	0.092	0.032	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.037	0.010	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Chromium, Total	0.314	J	mg/kg	0.367	0.033	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Copper, Total	1.83		mg/kg	0.092	0.031	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Lead, Total	0.282		mg/kg	0.037	0.005	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 12:46	EPA 7474	1,7474	BV
Nickel, Total	0.299		mg/kg	0.092	0.034	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM
Zinc, Total	8.70		mg/kg	0.917	0.137	2	01/04/19 18:20	01/14/19 17:46	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-32

Date Collected: 12/21/18 11:15

Client ID: B567S04MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.11		mg/kg	0.085	0.029	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Cadmium, Total	0.029	J	mg/kg	0.034	0.009	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Chromium, Total	0.383		mg/kg	0.339	0.031	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Copper, Total	1.54		mg/kg	0.085	0.028	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Lead, Total	0.375		mg/kg	0.034	0.005	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 12:55	EPA 7474	1,7474	BV
Nickel, Total	0.342		mg/kg	0.085	0.032	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM
Zinc, Total	9.50		mg/kg	0.847	0.126	2	01/04/19 18:20	01/14/19 17:51	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-33

Date Collected: 12/21/18 11:15

Client ID: B567S04MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.96		mg/kg	0.093	0.032	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Cadmium, Total	0.033	J	mg/kg	0.037	0.010	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Chromium, Total	0.300	J	mg/kg	0.374	0.034	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Copper, Total	1.46		mg/kg	0.093	0.031	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Lead, Total	0.283		mg/kg	0.037	0.005	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 12:57	EPA 7474	1,7474	BV
Nickel, Total	0.327		mg/kg	0.093	0.035	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM
Zinc, Total	9.33		mg/kg	0.934	0.139	2	01/04/19 18:20	01/14/19 17:55	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-34

Date Collected: 12/21/18 11:15

Client ID: B567S04MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.76		mg/kg	0.085	0.029	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Cadmium, Total	0.027	J	mg/kg	0.034	0.009	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Chromium, Total	0.271	J	mg/kg	0.339	0.031	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Copper, Total	1.45		mg/kg	0.085	0.028	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Lead, Total	0.254		mg/kg	0.034	0.005	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 13:00	EPA 7474	1,7474	BV
Nickel, Total	0.299		mg/kg	0.085	0.032	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM
Zinc, Total	9.01		mg/kg	0.847	0.126	2	01/04/19 18:20	01/14/19 18:00	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-35

Date Collected: 12/21/18 11:15

Client ID: B567S04MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.47		mg/kg	0.095	0.033	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Cadmium, Total	0.019	J	mg/kg	0.038	0.010	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Chromium, Total	0.347	J	mg/kg	0.381	0.034	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Copper, Total	1.36		mg/kg	0.095	0.032	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Lead, Total	0.364		mg/kg	0.038	0.006	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 13:02	EPA 7474	1,7474	BV
Nickel, Total	0.310		mg/kg	0.095	0.035	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM
Zinc, Total	7.63		mg/kg	0.952	0.142	2	01/04/19 18:20	01/14/19 18:05	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-36

Date Collected: 12/21/18 12:30

Client ID: B567S05MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.88		mg/kg	0.085	0.029	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Cadmium, Total	0.022	J	mg/kg	0.034	0.009	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Chromium, Total	0.359		mg/kg	0.339	0.031	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Copper, Total	2.30		mg/kg	0.085	0.028	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Lead, Total	0.582		mg/kg	0.034	0.005	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 13:05	EPA 7474	1,7474	BV
Nickel, Total	0.337		mg/kg	0.085	0.032	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM
Zinc, Total	8.53		mg/kg	0.847	0.126	2	01/04/19 18:20	01/14/19 18:09	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-37

Date Collected: 12/21/18 12:30

Client ID: B567S05MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.69		mg/kg	0.081	0.028	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Cadmium, Total	0.031	J	mg/kg	0.033	0.009	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Chromium, Total	0.927		mg/kg	0.325	0.029	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Copper, Total	2.65		mg/kg	0.081	0.027	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Lead, Total	0.794		mg/kg	0.033	0.005	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Mercury, Total	0.009	J	mg/kg	0.010	0.003	5	01/04/19 14:55	01/09/19 13:07	EPA 7474	1,7474	BV
Nickel, Total	0.449		mg/kg	0.081	0.030	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM
Zinc, Total	10.0		mg/kg	0.813	0.121	2	01/04/19 18:56	01/14/19 18:14	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-38

Date Collected: 12/21/18 12:30

Client ID: B567S05MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.79		mg/kg	0.093	0.032	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Cadmium, Total	0.031	J	mg/kg	0.037	0.010	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Chromium, Total	0.431		mg/kg	0.374	0.034	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Copper, Total	2.27		mg/kg	0.093	0.031	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Lead, Total	0.561		mg/kg	0.037	0.005	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Mercury, Total	0.006	J	mg/kg	0.012	0.003	5	01/04/19 14:55	01/09/19 13:10	EPA 7474	1,7474	BV
Nickel, Total	0.371		mg/kg	0.093	0.035	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM
Zinc, Total	11.5		mg/kg	0.934	0.139	2	01/04/19 18:56	01/14/19 18:18	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-39

Date Collected: 12/21/18 12:30

Client ID: B567S05MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.61		mg/kg	0.090	0.031	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.036	0.009	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Chromium, Total	0.361		mg/kg	0.360	0.032	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Copper, Total	1.90		mg/kg	0.090	0.030	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Lead, Total	0.522		mg/kg	0.036	0.005	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.011	0.003	5	01/04/19 14:55	01/09/19 13:12	EPA 7474	1,7474	BV
Nickel, Total	0.296		mg/kg	0.090	0.034	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM
Zinc, Total	9.84		mg/kg	0.901	0.134	2	01/04/19 18:56	01/14/19 18:23	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-40

Date Collected: 12/21/18 12:30

Client ID: B567S05MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.58		mg/kg	0.083	0.028	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.033	0.009	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Chromium, Total	0.363		mg/kg	0.330	0.030	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Copper, Total	1.75		mg/kg	0.083	0.028	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Lead, Total	0.574		mg/kg	0.033	0.005	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.010	0.003	5	01/04/19 14:55	01/09/19 13:14	EPA 7474	1,7474	BV
Nickel, Total	0.307		mg/kg	0.083	0.031	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM
Zinc, Total	8.37		mg/kg	0.826	0.123	2	01/04/19 18:56	01/14/19 18:55	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194805-1									
Arsenic, Total	ND	mg/kg	0.100	0.034	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Cadmium, Total	ND	mg/kg	0.040	0.011	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Chromium, Total	ND	mg/kg	0.400	0.036	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Copper, Total	ND	mg/kg	0.100	0.033	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Lead, Total	ND	mg/kg	0.040	0.006	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Nickel, Total	ND	mg/kg	0.100	0.037	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM
Zinc, Total	ND	mg/kg	1.00	0.149	2	01/04/19 11:40	01/09/19 15:37	1,6020B	AM

Prep Information

Digestion Method: EPA 3051A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194808-1									
Mercury, Total	ND	mg/kg	0.013	0.004	5	01/04/19 11:40	01/05/19 15:56	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 21-40 Batch: WG1194857-1									
Arsenic, Total	ND	mg/kg	0.100	0.034	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Cadmium, Total	ND	mg/kg	0.040	0.011	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Chromium, Total	ND	mg/kg	0.400	0.036	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Copper, Total	ND	mg/kg	0.100	0.033	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Lead, Total	ND	mg/kg	0.040	0.006	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Nickel, Total	ND	mg/kg	0.100	0.037	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM
Zinc, Total	ND	mg/kg	1.00	0.149	2	01/04/19 15:15	01/14/19 15:40	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3051A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 21-40 Batch: WG1194861-1									
Mercury, Total	ND	mg/kg	0.013	0.004	5	01/04/19 15:15	01/09/19 11:59	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194805-2								
Arsenic, Total	88		-		75-125	-		20
Cadmium, Total	92		-		75-125	-		20
Chromium, Total	86		-		75-125	-		20
Copper, Total	84		-		75-125	-		20
Lead, Total	96		-		75-125	-		20
Nickel, Total	86		-		75-125	-		20
Zinc, Total	87		-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194808-2 SRM Lot Number: HPHGAF								
Mercury, Total	122	Q	-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194857-2								
Arsenic, Total	101		-		75-125	-		20
Cadmium, Total	104		-		75-125	-		20
Chromium, Total	98		-		75-125	-		20
Copper, Total	97		-		75-125	-		20
Lead, Total	109		-		75-125	-		20
Nickel, Total	100		-		75-125	-		20
Zinc, Total	99		-		75-125	-		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194861-2 SRM Lot Number: HPHGAF					
Mercury, Total	113	-	80-120	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194805-3 WG1194805-4 QC Sample: L1853052-01 Client ID: B567PREMNA												
Arsenic, Total	1.76	10.5	11.5	92		10.8	85		75-125	6		20
Cadmium, Total	0.030J	4.47	4.14	92		3.88	86		75-125	6		20
Chromium, Total	0.461	17.5	15.1	83		14.2	78		75-125	6		20
Copper, Total	1.50	21.9	20.7	88		19.1	80		75-125	8		20
Lead, Total	0.274	44.7	45.5	101		43.0	95		75-125	6		20
Nickel, Total	0.378	43.8	39.0	88		35.9	80		75-125	8		20
Zinc, Total	11.1	43.8	48.6	86		44.9	76		75-125	8		20
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194808-3 WG1194808-4 QC Sample: L1853052-01 Client ID: B567PREMNA												
Mercury, Total	0.003J	0.543	0.551	101		0.575	102		80-120	4		20
Total Metals - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194857-3 WG1194857-4 QC Sample: L1853052-21 Client ID: B567S02MNA												
Arsenic, Total	2.25	10.8	13.0	99		12.2	102		75-125	6		20
Cadmium, Total	0.025J	4.59	4.69	102		4.27	103		75-125	9		20
Chromium, Total	0.363J	18	17.8	99		16.0	98		75-125	11		20
Copper, Total	2.01	22.5	23.4	95		21.6	96		75-125	8		20
Lead, Total	0.399	45.9	50.5	109		46.4	111		75-125	8		20
Nickel, Total	0.329	45	44.8	99		40.5	99		75-125	10		20
Zinc, Total	10.5	45	55.7	100		53.1	105		75-125	5		20
Total Metals - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194861-3 WG1194861-4 QC Sample: L1853052-21 Client ID: B567S02MNA												
Mercury, Total	ND	0.568	0.623	110		0.586	111		80-120	6		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194805-5 QC Sample: L1853052-02 Client ID: B567PREMNB						
Arsenic, Total	1.97	1.87	mg/kg	5		20
Cadmium, Total	0.031J	0.031J	mg/kg	NC		20
Chromium, Total	0.500	0.468	mg/kg	7		20
Copper, Total	1.75	1.83	mg/kg	4		20
Lead, Total	0.296	0.291	mg/kg	2		20
Nickel, Total	0.413	0.387	mg/kg	6		20
Zinc, Total	9.86	9.71	mg/kg	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194808-5 QC Sample: L1853052-02 Client ID: B567PREMNB						
Mercury, Total	0.004J	0.004J	mg/kg	NC		20
Total Metals - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194857-5 QC Sample: L1853052-22 Client ID: B567S02MNB						
Arsenic, Total	2.03	2.02	mg/kg	0		20
Cadmium, Total	0.022J	0.021J	mg/kg	NC		20
Chromium, Total	0.355	0.342J	mg/kg	NC		20
Copper, Total	2.07	2.18	mg/kg	5		20
Lead, Total	0.384	0.374	mg/kg	3		20
Nickel, Total	0.350	0.338	mg/kg	3		20
Zinc, Total	8.67	8.85	mg/kg	2		20
Total Metals - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194861-5 QC Sample: L1853052-22 Client ID: B567S02MNB						
Mercury, Total	ND	ND	mg/kg	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194805-8

Parameter	% Recovery	Qual	QC Criteria
Arsenic, Total	60	Q	65-139
Cadmium, Total	66	Q	67-135
Copper, Total	101		65-138
Lead, Total	96		56-155
Zinc, Total	58	Q	66-136

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**S.R.M. Standard Quality Control**

Standard Reference Material (SRM): WG1194808-13

Parameter	% Recovery	Qual	QC Criteria
Mercury, Total	49		41-183

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853052
Report Date: 01/24/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194857-8

Parameter	% Recovery	Qual	QC Criteria
Arsenic, Total	60	Q	65-139
Cadmium, Total	66	Q	67-135
Copper, Total	90		65-138
Lead, Total	91		56-155
Zinc, Total	60	Q	66-136

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**S.R.M. Standard Quality Control**

Standard Reference Material (SRM): WG1194861-6

Parameter	% Recovery	Qual	QC Criteria
Mercury, Total	95		41-183

INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-01
 Client ID: B567PREMNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.792		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-02

Date Collected: 12/21/18 10:15

Client ID: B567PREMNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.563		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-03

Date Collected: 12/21/18 10:15

Client ID: B567PREMNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.688		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-11
 Client ID: B567R01MNA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/21/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	84.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.897		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-12

Date Collected: 12/21/18 09:30

Client ID: B567R01MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.650		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-13

Date Collected: 12/21/18 09:30

Client ID: B567R01MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.648		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-14

Date Collected: 12/21/18 09:30

Client ID: B567R01MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	84.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.730		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-15

Date Collected: 12/21/18 09:30

Client ID: B567R01MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	85.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.705		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-16

Date Collected: 12/21/18 10:30

Client ID: B567S01MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.604		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-17

Date Collected: 12/21/18 10:30

Client ID: B567S01MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.575		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-18

Date Collected: 12/21/18 10:30

Client ID: B567S01MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.706		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-19

Date Collected: 12/21/18 10:30

Client ID: B567S01MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.664		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-20

Date Collected: 12/21/18 10:30

Client ID: B567S01MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.695		%	0.100	NA	1	-	01/05/19 00:00	111,-	KO



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-21

Date Collected: 12/21/18 10:45

Client ID: B567S02MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.647		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-22

Date Collected: 12/21/18 10:45

Client ID: B567S02MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.639		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-23

Date Collected: 12/21/18 10:45

Client ID: B567S02MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.734		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-24

Date Collected: 12/21/18 10:45

Client ID: B567S02MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.676		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-25

Date Collected: 12/21/18 10:45

Client ID: B567S02MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.743		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-26

Date Collected: 12/21/18 11:15

Client ID: B567S03MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	89.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.653		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-27

Date Collected: 12/21/18 11:15

Client ID: B567S03MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.541		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-28

Date Collected: 12/21/18 11:15

Client ID: B567S03MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.743		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-29

Date Collected: 12/21/18 11:15

Client ID: B567S03MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.593		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-30

Date Collected: 12/21/18 11:15

Client ID: B567S03MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.674		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-31

Date Collected: 12/21/18 11:15

Client ID: B567S04MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.661		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-32

Date Collected: 12/21/18 11:15

Client ID: B567S04MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.714		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-33

Date Collected: 12/21/18 11:15

Client ID: B567S04MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.692		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-34

Date Collected: 12/21/18 11:15

Client ID: B567S04MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.539		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-35

Date Collected: 12/21/18 11:15

Client ID: B567S04MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.637		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-36

Date Collected: 12/21/18 12:30

Client ID: B567S05MNA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.660		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-37

Date Collected: 12/21/18 12:30

Client ID: B567S05MNB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.783		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-38

Date Collected: 12/21/18 12:30

Client ID: B567S05MNC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.710		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-39

Date Collected: 12/21/18 12:30

Client ID: B567S05MND

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.577		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853052**Project Number:** 60588790 TASK 10.0**Report Date:** 01/24/19**SAMPLE RESULTS**

Lab ID: L1853052-40

Date Collected: 12/21/18 12:30

Client ID: B567S05MNE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Macoma

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.506		%	0.100	NA	1	-	01/06/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194954-1									
Percent Lipids	ND	%	0.100	NA	1	-	01/05/19 00:00	111,-	KO
General Chemistry - Mansfield Lab for sample(s): 21-40 Batch: WG1195120-1									
Percent Lipids	ND	%	0.100	NA	1	-	01/06/19 00:00	111,-	AL

Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853052

Report Date: 01/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194765-1 QC Sample: L1853052-02 Client ID: B567PREMNB						
Moisture	87.0	87.0	%	0		10
General Chemistry - Mansfield Lab Associated sample(s): 21-30 QC Batch ID: WG1194766-1 QC Sample: L1853052-22 Client ID: B567S02MNB						
Moisture	87.0	87.0	%	0		10
General Chemistry - Mansfield Lab Associated sample(s): 31-40 QC Batch ID: WG1194768-1 QC Sample: L1853052-31 Client ID: B567S04MNA						
Moisture	88.0	88.0	%	0		10
General Chemistry - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194954-2 QC Sample: L1853052-02 Client ID: B567PREMNB						
Percent Lipids	0.563	0.600	%	6		20
General Chemistry - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1195120-2 QC Sample: L1853052-22 Client ID: B567S02MNB						
Percent Lipids	0.639	0.714	%	11		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Serial_No:01241915:58

Lab Number: L1853052

Report Date: 01/24/19

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-01A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-02A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-03A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-04A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-ARCHIVE()
L1853052-05A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-06A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-07A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-08A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-09A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-10A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-11A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-12A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-13A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-14A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-15A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-16A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-17A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-18A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-19A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-20A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-21A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-22A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-23A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-24A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853052

Project Number: 60588790 TASK 10.0

Report Date: 01/24/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-25A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-26A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-27A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-28A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-29A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-30A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-31A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-32A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-33A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-34A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-35A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-36A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853052-37A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-38A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-39A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853052-40A	Glass 250ml/8oz unpreserved	A	NA		-5.2	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

*Values in parentheses indicate holding time in days



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GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
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Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

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REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 111 NOAA Technical Memorandum NOS ORCA 130: Sampling and Analytical Methods of the National Status and Trends Program Mussel Watch Project: 1993-196 Update. March 1998.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	No – See case narrative.
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	No – See case narrative
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	Yes
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No – See case narrative
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	





Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No All within SOP criteria	<p>CCV: associated with L1853052-01 through -03, 11 through -20: Hexachlorobenzene @ 17% on column B</p> <p>CCV: associated with L1853052-21 through -31: Column A: Methoxychlor @ 16% Column B: 4,4'-DDT @ 16%, Methoxychlor @ 19%</p> <p>CCV: associated with L1853052-34 through -40: Column A: Methoxychlor @ 18% Column B: cis-Nonachlor @ 17%, 4,4'-DDT @ 19%, Methoxychlor @ 18%</p> <p>CCV: associated with L1853052-32 and -33: Column A: Methoxychlor @ 17% Column B: cis-Nonachlor @ 17%, 4,4'-DDT @ 16%, Methoxychlor @ 18%</p>	Retained at Lab





*QC Summary Tables
US Army Corps of Engineers*

Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No All within SOP criteria	CCV associated with Batch QCs: C17-BZ#170 @ 18%, C16-BZ#126 @ 17%, C19-BZ#206 @ 18%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	L1853052-22Dup: C13-BZ#18 @ 43%	In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	No	Annual	Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	WG1194805-8 As(60%), Cd(66%), Zn(58%) WG1194857-8 As(60%), Cd(66%), Zn(60%)	In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





4853052

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (PIG/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	B567PreMnA	12/21/18	1015	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
002	B567PreMnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
003	B567PreMnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
004	B567PreMnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
005	B567PreMnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
006	B567LabMnA	12/21/18	0910	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
007	B567LabMnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
008	B567LabMnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
009	B567LabMnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
010	B567LabMnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
011	B567R01MnA	12/21/18	0930	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
012	B567R01MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C

Relinquished By:	Date: 12/26/18	Time: 1100	Received By:	Date: 12/26/18	Time: 1100
Relinquished By:	Date: 12/26/18	Time: 1320	Received at Lab By:	Date: 12/26/18	Time: 1320

Comments:

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L1853052

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	<i>31249 (Mn)</i>
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy.com	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
013	B567R01MnC	12/21/18	<i>0930</i>	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
014	B567R01MnD	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
015	B567R01MnE	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
016	B567S01MnA	12/21/18	<i>1030</i>	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
017	B567S01MnB	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
018	B567S01MnC	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
019	B567S01MnD	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
020	B567S01MnE	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
021	B567S02MnA	12/21/18	<i>1045</i>	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
022	B567S02MnB	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
023	B567S02MnC	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
024	B567S02MnD	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C

Relinquished By: <i>[Signature]</i>	Date: 12/20/18	Time: 1100	Received By: <i>T. Humble</i>	Date: 12/26/18	Time: 1100
Relinquished By: <i>T. Humble</i>	Date: 12/26/18	Time: 1320	Received at Lab By: <i>[Signature]</i>	Date: 12/26/18	Time: 1300

Comments:

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CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalp	

Protocol: NPDES ERR

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
025	B567S02MnE	12/21/18	1045	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
026	B567S03MnA	12/21/18	1115	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
027	B567S03MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
028	B567S03MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
029	B567S03MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
030	B567S03MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
031	B567S04MnA	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
032	B567S04MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
033	B567S04MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
034	B567S04MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
035	B567S04MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C
036	B567S05MnA	12/21/18	1230	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680,Total Metals As,C

Relinquished By:	Date: 12/26/18	Time: 1100	Received By:	Date: 12/26/18	Time: 1100
Relinquished By:	Date: 12/26/18	Time: 1320	Received at Lab By:	Date: 12/26/18	Time: 1320

Comments:

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EnviroSystems, Inc.
1 Lafayette Road
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Voice: 603-926-3345
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ESI Job No:

Serial_No:01241915:58

41853052

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalp.com	

Protocol: NPDES

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Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
037	B567S05MnB	12/21/18	1230	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
038	B567S05MnC	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
039	B567S05MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
040	B567S05MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C

Relinquished By: <i>[Signature]</i>	Date: 12/26/18	Time: 1100	Received By: <i>T. Hurdle</i>	Date: 12/26/18	Time: 1100
Relinquished By: <i>T. Hurdle</i>	Date: 12/26/18	Time: 1320	Received at Lab By: <i>[Signature]</i>	Date: 12/26/18	Time: 1320

Comments:

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COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

28-Day Bioassay Preliminary Tissue Report

- ***Nereis virens* Data**



ANALYTICAL REPORT

Lab Number:	L1853059
Client:	AECOM 250 Apollo Drive Chelmsford, MA 01824
ATTN:	Kris VanNaerssen
Phone:	(978) 833-6950
Project Name:	NEW HAVEN HARBOR SUPPLEMENTAL
Project Number:	60588790 TASK 10.0
Report Date:	01/25/19

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1853059-01	B567PRENVA	NEREIS	NEW HAVEN, CT	12/20/18 09:00	12/26/18
L1853059-02	B567PRENVB	NEREIS	NEW HAVEN, CT	12/20/18 09:00	12/26/18
L1853059-03	B567PRENVC	NEREIS	NEW HAVEN, CT	12/20/18 09:00	12/26/18
L1853059-04	B567PRENVD	NEREIS	NEW HAVEN, CT	12/20/18 09:00	12/26/18
L1853059-05	B567PRENVE	NEREIS	NEW HAVEN, CT	12/20/18 09:00	12/26/18
L1853059-06	B567LABNVA	NEREIS	NEW HAVEN, CT	12/20/18 09:15	12/26/18
L1853059-07	B567LABNVB	NEREIS	NEW HAVEN, CT	12/20/18 09:15	12/26/18
L1853059-08	B567LABNVC	NEREIS	NEW HAVEN, CT	12/20/18 09:15	12/26/18
L1853059-09	B567LABNVD	NEREIS	NEW HAVEN, CT	12/20/18 09:15	12/26/18
L1853059-10	B567LABNVE	NEREIS	NEW HAVEN, CT	12/20/18 09:15	12/26/18
L1853059-11	B567R01NVA	NEREIS	NEW HAVEN, CT	12/20/18 09:30	12/26/18
L1853059-12	B567R01NVB	NEREIS	NEW HAVEN, CT	12/20/18 09:30	12/26/18
L1853059-13	B567R01NVC	NEREIS	NEW HAVEN, CT	12/20/18 09:30	12/26/18
L1853059-14	B567R01NVD	NEREIS	NEW HAVEN, CT	12/20/18 09:30	12/26/18
L1853059-15	B567R01NVE	NEREIS	NEW HAVEN, CT	12/20/18 09:30	12/26/18
L1853059-16	B567S01NVA	NEREIS	NEW HAVEN, CT	12/20/18 09:45	12/26/18
L1853059-17	B567S01NVB	NEREIS	NEW HAVEN, CT	12/20/18 09:45	12/26/18
L1853059-18	B567S01NVC	NEREIS	NEW HAVEN, CT	12/20/18 09:45	12/26/18
L1853059-19	B567S01NVD	NEREIS	NEW HAVEN, CT	12/20/18 09:45	12/26/18
L1853059-20	B567S01NVE	NEREIS	NEW HAVEN, CT	12/20/18 09:45	12/26/18
L1853059-21	B567S02NVA	NEREIS	NEW HAVEN, CT	12/20/18 10:00	12/26/18
L1853059-22	B567S02NVB	NEREIS	NEW HAVEN, CT	12/20/18 10:00	12/26/18
L1853059-23	B567S02NVC	NEREIS	NEW HAVEN, CT	12/20/18 10:00	12/26/18
L1853059-24	B567S02NVD	NEREIS	NEW HAVEN, CT	12/20/18 10:00	12/26/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1853059-25	B567S02NVE	NEREIS	NEW HAVEN, CT	12/20/18 10:00	12/26/18
L1853059-26	B567S03NVA	NEREIS	NEW HAVEN, CT	12/20/18 10:15	12/26/18
L1853059-27	B567S03NVB	NEREIS	NEW HAVEN, CT	12/20/18 10:15	12/26/18
L1853059-28	B567S03NVC	NEREIS	NEW HAVEN, CT	12/20/18 10:15	12/26/18
L1853059-29	B567S03NVD	NEREIS	NEW HAVEN, CT	12/20/18 10:15	12/26/18
L1853059-30	B567S03NVE	NEREIS	NEW HAVEN, CT	12/20/18 10:15	12/26/18
L1853059-31	B567S04NVA	NEREIS	NEW HAVEN, CT	12/20/18 10:30	12/26/18
L1853059-32	B567S04NVB	NEREIS	NEW HAVEN, CT	12/20/18 10:30	12/26/18
L1853059-33	B567S04NVC	NEREIS	NEW HAVEN, CT	12/20/18 10:30	12/26/18
L1853059-34	B567S04NVD	NEREIS	NEW HAVEN, CT	12/20/18 10:30	12/26/18
L1853059-35	B567S04NVE	NEREIS	NEW HAVEN, CT	12/20/18 10:30	12/26/18
L1853059-36	B567S05NVA	NEREIS	NEW HAVEN, CT	12/20/18 10:45	12/26/18
L1853059-37	B567S05NVB	NEREIS	NEW HAVEN, CT	12/20/18 10:45	12/26/18
L1853059-38	B567S05NVC	NEREIS	NEW HAVEN, CT	12/20/18 10:45	12/26/18
L1853059-39	B567S05NVD	NEREIS	NEW HAVEN, CT	12/20/18 10:45	12/26/18
L1853059-40	B567S05NVE	NEREIS	NEW HAVEN, CT	12/20/18 10:45	12/26/18

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

The samples were received at the laboratory below the required temperature range. The samples were transported to the laboratory in a cooler with ice and were noted to be frozen.

Semivolatile Organics

L1853059: PCB Congeners did not achieve the requested regulatory limits due to the current lab RL, however results were reported to the MDL.

The WG1194727-4 MS recovery, performed on L1853059-01, is outside the acceptance criteria for cl4-bz#49 (49%); however, the associated LCS/LCSD recoveries are within overall method allowances. No further action was required.

The WG1194727-5 MSD recovery, performed on L1853059-01, is outside the acceptance criteria for cl3-bz#18 (193%); however, the associated LCS/LCSD recoveries are within overall method allowances. No further action was required.

The WG1194727-4/-5 MS/MSD RPD for cl3-bz#18 (55%), performed on L1853059-12, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

The WG1194727-6 Laboratory Duplicate RPDs for cl6-bz#153 (32%), cl7-bz#180 (35%), and cl7-bz#187 (39%), performed on L1853059-02, are outside the acceptance criteria. The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

The WG1194731-7 Standard Reference Material is outside the QC limits for Cl3-BZ#28 (35%).

Pesticides

L1853059: Methoxychlor did not achieve the requested regulatory limits due to the current lab RL, however

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Case Narrative (continued)

results were reported to the MDL.

The WG1194728-2 LCS recoveries, associated with L1853059-01, -02, -03, -11, -12, -13, 14, -15, -16, -17, -18, -19, and -20, are outside the acceptance criteria for methoxychlor (17%) and endosulfan II (45%); however, the LCSD/MS/MSD recoveries are within the method criteria. The results of the associated samples are reported.

The WG1194728-2/-3 LCS/LCSD RPD(s), associated with L1853059-01, -02, -03, -11, -12, -13, -14, -15, -16, -17, -18, -19, and -20, are above the acceptance criteria for endosulfan i (31%), endrin (40%), methoxychlor (122%) and endosulfan II (52%).

Total Metals

The WG1195377-5 Laboratory Duplicate RPD for zinc (26%), performed on L1853059-02, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

The WG1195380-5 Laboratory Duplicate RPD for zinc (107%), performed on L1853059-22, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

The WG1195377-6 SRM recoveries, associated with L1853059-01 through -03, -11 through -20 and -38 through -40 are outside the acceptance criteria for arsenic (55%), cadmium (61%) and zinc (54%); however, the associated LCS recovery is within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 01/25/19

ORGANICS

SEMIVOLATILES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-01
 Client ID: B567PRENVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 22:49
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.49	4.74	1
Acenaphthylene	ND		ug/kg	9.49	4.74	1
Acenaphthene	ND		ug/kg	9.49	4.74	1
Fluorene	ND		ug/kg	9.49	4.74	1
Phenanthrene	5.45	J	ug/kg	9.49	4.74	1
Anthracene	ND		ug/kg	9.49	4.74	1
Fluoranthene	5.49	J	ug/kg	9.49	4.74	1
Pyrene	4.94	J	ug/kg	9.49	4.74	1
Benz(a)anthracene	ND		ug/kg	9.49	4.74	1
Chrysene	ND		ug/kg	9.49	4.74	1
Benzo(b)fluoranthene	ND		ug/kg	9.49	4.74	1
Benzo(k)fluoranthene	ND		ug/kg	9.49	4.74	1
Benzo(a)pyrene	ND		ug/kg	9.49	4.74	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.49	4.74	1
Dibenz(a,h)anthracene	ND		ug/kg	9.49	4.74	1
Benzo(ghi)perylene	ND		ug/kg	9.49	4.74	1
Cl2-BZ#8	ND		ug/kg	0.949	0.474	1
Cl3-BZ#18	ND		ug/kg	0.949	0.474	1
Cl3-BZ#28	ND		ug/kg	0.949	0.474	1
Cl4-BZ#44	ND		ug/kg	0.949	0.474	1
Cl4-BZ#49	ND		ug/kg	0.949	0.474	1
Cl4-BZ#52	ND		ug/kg	0.949	0.474	1
Cl4-BZ#66	ND		ug/kg	0.949	0.474	1
Cl5-BZ#87	ND		ug/kg	0.949	0.474	1
Cl5-BZ#101	0.496	J	ug/kg	0.949	0.474	1
Cl5-BZ#105	ND		ug/kg	0.949	0.474	1
Cl5-BZ#118	ND		ug/kg	0.949	0.474	1
Cl6-BZ#128	ND		ug/kg	0.949	0.474	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-01
 Client ID: B567PRENVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	1.80		ug/kg	0.949	0.474	1
Cl6-BZ#153	2.56		ug/kg	0.949	0.474	1
Cl7-BZ#170	0.882	J	ug/kg	0.949	0.474	1
Cl7-BZ#180	2.51		ug/kg	0.949	0.474	1
Cl7-BZ#183	0.832	J	ug/kg	0.949	0.474	1
Cl7-BZ#184	ND		ug/kg	0.949	0.474	1
Cl7-BZ#187	2.09		ug/kg	0.949	0.474	1
Cl8-BZ#195	ND		ug/kg	0.949	0.474	1
Cl9-BZ#206	ND		ug/kg	0.949	0.474	1
Cl10-BZ#209	ND		ug/kg	0.949	0.474	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-150
Pyrene-d10	73		30-150
Benzo(b)fluoranthene-d12	68		30-150
DBOB	79		30-150
BZ 198	61		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-02
 Client ID: B567PRENVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 23:23
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.42	4.71	1
Acenaphthylene	ND		ug/kg	9.42	4.71	1
Acenaphthene	ND		ug/kg	9.42	4.71	1
Fluorene	ND		ug/kg	9.42	4.71	1
Phenanthrene	ND		ug/kg	9.42	4.71	1
Anthracene	ND		ug/kg	9.42	4.71	1
Fluoranthene	ND		ug/kg	9.42	4.71	1
Pyrene	ND		ug/kg	9.42	4.71	1
Benz(a)anthracene	ND		ug/kg	9.42	4.71	1
Chrysene	ND		ug/kg	9.42	4.71	1
Benzo(b)fluoranthene	ND		ug/kg	9.42	4.71	1
Benzo(k)fluoranthene	ND		ug/kg	9.42	4.71	1
Benzo(a)pyrene	ND		ug/kg	9.42	4.71	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.42	4.71	1
Dibenz(a,h)anthracene	ND		ug/kg	9.42	4.71	1
Benzo(ghi)perylene	ND		ug/kg	9.42	4.71	1
Cl2-BZ#8	ND		ug/kg	0.942	0.471	1
Cl3-BZ#18	ND		ug/kg	0.942	0.471	1
Cl3-BZ#28	ND		ug/kg	0.942	0.471	1
Cl4-BZ#44	ND		ug/kg	0.942	0.471	1
Cl4-BZ#49	ND		ug/kg	0.942	0.471	1
Cl4-BZ#52	ND		ug/kg	0.942	0.471	1
Cl4-BZ#66	ND		ug/kg	0.942	0.471	1
Cl5-BZ#87	ND		ug/kg	0.942	0.471	1
Cl5-BZ#101	ND		ug/kg	0.942	0.471	1
Cl5-BZ#105	ND		ug/kg	0.942	0.471	1
Cl5-BZ#118	ND		ug/kg	0.942	0.471	1
Cl6-BZ#128	ND		ug/kg	0.942	0.471	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-02
Client ID: B567PRENVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	2.28		ug/kg	0.942	0.471	1
CI6-BZ#153	2.58		ug/kg	0.942	0.471	1
CI7-BZ#170	1.01		ug/kg	0.942	0.471	1
CI7-BZ#180	2.70		ug/kg	0.942	0.471	1
CI7-BZ#183	0.880	J	ug/kg	0.942	0.471	1
CI7-BZ#184	ND		ug/kg	0.942	0.471	1
CI7-BZ#187	1.79		ug/kg	0.942	0.471	1
CI8-BZ#195	ND		ug/kg	0.942	0.471	1
CI9-BZ#206	ND		ug/kg	0.942	0.471	1
CI10-BZ#209	ND		ug/kg	0.942	0.471	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	72		30-150
Pyrene-d10	76		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	84		30-150
BZ 198	65		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-03
 Client ID: B567PRENVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 00:31
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.28	4.64	1
Acenaphthylene	ND		ug/kg	9.28	4.64	1
Acenaphthene	9.87		ug/kg	9.28	4.64	1
Fluorene	ND		ug/kg	9.28	4.64	1
Phenanthrene	ND		ug/kg	9.28	4.64	1
Anthracene	ND		ug/kg	9.28	4.64	1
Fluoranthene	ND		ug/kg	9.28	4.64	1
Pyrene	ND		ug/kg	9.28	4.64	1
Benz(a)anthracene	ND		ug/kg	9.28	4.64	1
Chrysene	ND		ug/kg	9.28	4.64	1
Benzo(b)fluoranthene	ND		ug/kg	9.28	4.64	1
Benzo(k)fluoranthene	ND		ug/kg	9.28	4.64	1
Benzo(a)pyrene	ND		ug/kg	9.28	4.64	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.28	4.64	1
Dibenz(a,h)anthracene	ND		ug/kg	9.28	4.64	1
Benzo(ghi)perylene	ND		ug/kg	9.28	4.64	1
Cl2-BZ#8	1.68		ug/kg	0.928	0.464	1
Cl3-BZ#18	5.28		ug/kg	0.928	0.464	1
Cl3-BZ#28	ND		ug/kg	0.928	0.464	1
Cl4-BZ#44	ND		ug/kg	0.928	0.464	1
Cl4-BZ#49	0.611	J	ug/kg	0.928	0.464	1
Cl4-BZ#52	0.582	J	ug/kg	0.928	0.464	1
Cl4-BZ#66	ND		ug/kg	0.928	0.464	1
Cl5-BZ#87	ND		ug/kg	0.928	0.464	1
Cl5-BZ#101	0.525	J	ug/kg	0.928	0.464	1
Cl5-BZ#105	ND		ug/kg	0.928	0.464	1
Cl5-BZ#118	ND		ug/kg	0.928	0.464	1
Cl6-BZ#128	ND		ug/kg	0.928	0.464	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-03
 Client ID: B567PRENVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	2.78		ug/kg	0.928	0.464	1
Cl6-BZ#153	4.15		ug/kg	0.928	0.464	1
Cl7-BZ#170	1.71		ug/kg	0.928	0.464	1
Cl7-BZ#180	3.76		ug/kg	0.928	0.464	1
Cl7-BZ#183	0.995		ug/kg	0.928	0.464	1
Cl7-BZ#184	ND		ug/kg	0.928	0.464	1
Cl7-BZ#187	2.89		ug/kg	0.928	0.464	1
Cl8-BZ#195	ND		ug/kg	0.928	0.464	1
Cl9-BZ#206	ND		ug/kg	0.928	0.464	1
Cl10-BZ#209	ND		ug/kg	0.928	0.464	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	84		30-150
Benzo(b)fluoranthene-d12	77		30-150
DBOB	98		30-150
BZ 198	72		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-11
 Client ID: B567R01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 01:05
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.11	4.55	1
Acenaphthylene	ND		ug/kg	9.11	4.55	1
Acenaphthene	ND		ug/kg	9.11	4.55	1
Fluorene	ND		ug/kg	9.11	4.55	1
Phenanthrene	ND		ug/kg	9.11	4.55	1
Anthracene	ND		ug/kg	9.11	4.55	1
Fluoranthene	ND		ug/kg	9.11	4.55	1
Pyrene	ND		ug/kg	9.11	4.55	1
Benz(a)anthracene	ND		ug/kg	9.11	4.55	1
Chrysene	ND		ug/kg	9.11	4.55	1
Benzo(b)fluoranthene	ND		ug/kg	9.11	4.55	1
Benzo(k)fluoranthene	ND		ug/kg	9.11	4.55	1
Benzo(a)pyrene	ND		ug/kg	9.11	4.55	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.11	4.55	1
Dibenz(a,h)anthracene	ND		ug/kg	9.11	4.55	1
Benzo(ghi)perylene	ND		ug/kg	9.11	4.55	1
Cl2-BZ#8	ND		ug/kg	0.911	0.455	1
Cl3-BZ#18	ND		ug/kg	0.911	0.455	1
Cl3-BZ#28	ND		ug/kg	0.911	0.455	1
Cl4-BZ#44	ND		ug/kg	0.911	0.455	1
Cl4-BZ#49	ND		ug/kg	0.911	0.455	1
Cl4-BZ#52	ND		ug/kg	0.911	0.455	1
Cl4-BZ#66	ND		ug/kg	0.911	0.455	1
Cl5-BZ#87	ND		ug/kg	0.911	0.455	1
Cl5-BZ#101	ND		ug/kg	0.911	0.455	1
Cl5-BZ#105	ND		ug/kg	0.911	0.455	1
Cl5-BZ#118	ND		ug/kg	0.911	0.455	1
Cl6-BZ#128	ND		ug/kg	0.911	0.455	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-11
 Client ID: B567R01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.42		ug/kg	0.911	0.455	1
CI6-BZ#153	2.13		ug/kg	0.911	0.455	1
CI7-BZ#170	0.757	J	ug/kg	0.911	0.455	1
CI7-BZ#180	2.30		ug/kg	0.911	0.455	1
CI7-BZ#183	0.626	J	ug/kg	0.911	0.455	1
CI7-BZ#184	ND		ug/kg	0.911	0.455	1
CI7-BZ#187	1.84		ug/kg	0.911	0.455	1
CI8-BZ#195	ND		ug/kg	0.911	0.455	1
CI9-BZ#206	ND		ug/kg	0.911	0.455	1
CI10-BZ#209	ND		ug/kg	0.911	0.455	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-150
Pyrene-d10	75		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	86		30-150
BZ 198	67		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-12
 Client ID: B567R01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 01:39
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.59	4.30	1
Acenaphthylene	ND		ug/kg	8.59	4.30	1
Acenaphthene	ND		ug/kg	8.59	4.30	1
Fluorene	ND		ug/kg	8.59	4.30	1
Phenanthrene	ND		ug/kg	8.59	4.30	1
Anthracene	ND		ug/kg	8.59	4.30	1
Fluoranthene	ND		ug/kg	8.59	4.30	1
Pyrene	ND		ug/kg	8.59	4.30	1
Benz(a)anthracene	ND		ug/kg	8.59	4.30	1
Chrysene	ND		ug/kg	8.59	4.30	1
Benzo(b)fluoranthene	ND		ug/kg	8.59	4.30	1
Benzo(k)fluoranthene	ND		ug/kg	8.59	4.30	1
Benzo(a)pyrene	ND		ug/kg	8.59	4.30	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.59	4.30	1
Dibenz(a,h)anthracene	ND		ug/kg	8.59	4.30	1
Benzo(ghi)perylene	ND		ug/kg	8.59	4.30	1
Cl2-BZ#8	ND		ug/kg	0.859	0.430	1
Cl3-BZ#18	ND		ug/kg	0.859	0.430	1
Cl3-BZ#28	ND		ug/kg	0.859	0.430	1
Cl4-BZ#44	ND		ug/kg	0.859	0.430	1
Cl4-BZ#49	ND		ug/kg	0.859	0.430	1
Cl4-BZ#52	ND		ug/kg	0.859	0.430	1
Cl4-BZ#66	ND		ug/kg	0.859	0.430	1
Cl5-BZ#87	ND		ug/kg	0.859	0.430	1
Cl5-BZ#101	ND		ug/kg	0.859	0.430	1
Cl5-BZ#105	ND		ug/kg	0.859	0.430	1
Cl5-BZ#118	ND		ug/kg	0.859	0.430	1
Cl6-BZ#128	ND		ug/kg	0.859	0.430	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-12
 Client ID: B567R01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	0.921		ug/kg	0.859	0.430	1
Cl6-BZ#153	1.42		ug/kg	0.859	0.430	1
Cl7-BZ#170	ND		ug/kg	0.859	0.430	1
Cl7-BZ#180	0.818	J	ug/kg	0.859	0.430	1
Cl7-BZ#183	ND		ug/kg	0.859	0.430	1
Cl7-BZ#184	ND		ug/kg	0.859	0.430	1
Cl7-BZ#187	0.582	J	ug/kg	0.859	0.430	1
Cl8-BZ#195	ND		ug/kg	0.859	0.430	1
Cl9-BZ#206	ND		ug/kg	0.859	0.430	1
Cl10-BZ#209	ND		ug/kg	0.859	0.430	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-150
Pyrene-d10	75		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	90		30-150
BZ 198	65		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-13
 Client ID: B567R01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 02:12
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.45	4.72	1
Acenaphthylene	ND		ug/kg	9.45	4.72	1
Acenaphthene	ND		ug/kg	9.45	4.72	1
Fluorene	ND		ug/kg	9.45	4.72	1
Phenanthrene	ND		ug/kg	9.45	4.72	1
Anthracene	ND		ug/kg	9.45	4.72	1
Fluoranthene	ND		ug/kg	9.45	4.72	1
Pyrene	ND		ug/kg	9.45	4.72	1
Benz(a)anthracene	ND		ug/kg	9.45	4.72	1
Chrysene	ND		ug/kg	9.45	4.72	1
Benzo(b)fluoranthene	ND		ug/kg	9.45	4.72	1
Benzo(k)fluoranthene	ND		ug/kg	9.45	4.72	1
Benzo(a)pyrene	ND		ug/kg	9.45	4.72	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.45	4.72	1
Dibenz(a,h)anthracene	ND		ug/kg	9.45	4.72	1
Benzo(ghi)perylene	ND		ug/kg	9.45	4.72	1
Cl2-BZ#8	ND		ug/kg	0.945	0.472	1
Cl3-BZ#18	ND		ug/kg	0.945	0.472	1
Cl3-BZ#28	ND		ug/kg	0.945	0.472	1
Cl4-BZ#44	ND		ug/kg	0.945	0.472	1
Cl4-BZ#49	ND		ug/kg	0.945	0.472	1
Cl4-BZ#52	ND		ug/kg	0.945	0.472	1
Cl4-BZ#66	ND		ug/kg	0.945	0.472	1
Cl5-BZ#87	ND		ug/kg	0.945	0.472	1
Cl5-BZ#101	ND		ug/kg	0.945	0.472	1
Cl5-BZ#105	ND		ug/kg	0.945	0.472	1
Cl5-BZ#118	ND		ug/kg	0.945	0.472	1
Cl6-BZ#128	ND		ug/kg	0.945	0.472	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-13
 Client ID: B567R01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	0.821	J	ug/kg	0.945	0.472	1
Cl6-BZ#153	1.31		ug/kg	0.945	0.472	1
Cl7-BZ#170	ND		ug/kg	0.945	0.472	1
Cl7-BZ#180	1.19		ug/kg	0.945	0.472	1
Cl7-BZ#183	ND		ug/kg	0.945	0.472	1
Cl7-BZ#184	ND		ug/kg	0.945	0.472	1
Cl7-BZ#187	0.606	J	ug/kg	0.945	0.472	1
Cl8-BZ#195	ND		ug/kg	0.945	0.472	1
Cl9-BZ#206	ND		ug/kg	0.945	0.472	1
Cl10-BZ#209	ND		ug/kg	0.945	0.472	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	68		30-150
Pyrene-d10	72		30-150
Benzo(b)fluoranthene-d12	67		30-150
DBOB	82		30-150
BZ 198	61		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-14
 Client ID: B567R01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 02:46
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.47	4.73	1
Acenaphthylene	ND		ug/kg	9.47	4.73	1
Acenaphthene	ND		ug/kg	9.47	4.73	1
Fluorene	ND		ug/kg	9.47	4.73	1
Phenanthrene	ND		ug/kg	9.47	4.73	1
Anthracene	ND		ug/kg	9.47	4.73	1
Fluoranthene	ND		ug/kg	9.47	4.73	1
Pyrene	ND		ug/kg	9.47	4.73	1
Benz(a)anthracene	ND		ug/kg	9.47	4.73	1
Chrysene	ND		ug/kg	9.47	4.73	1
Benzo(b)fluoranthene	ND		ug/kg	9.47	4.73	1
Benzo(k)fluoranthene	ND		ug/kg	9.47	4.73	1
Benzo(a)pyrene	ND		ug/kg	9.47	4.73	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.47	4.73	1
Dibenz(a,h)anthracene	ND		ug/kg	9.47	4.73	1
Benzo(ghi)perylene	ND		ug/kg	9.47	4.73	1
Cl2-BZ#8	ND		ug/kg	0.947	0.473	1
Cl3-BZ#18	ND		ug/kg	0.947	0.473	1
Cl3-BZ#28	ND		ug/kg	0.947	0.473	1
Cl4-BZ#44	ND		ug/kg	0.947	0.473	1
Cl4-BZ#49	ND		ug/kg	0.947	0.473	1
Cl4-BZ#52	ND		ug/kg	0.947	0.473	1
Cl4-BZ#66	ND		ug/kg	0.947	0.473	1
Cl5-BZ#87	ND		ug/kg	0.947	0.473	1
Cl5-BZ#101	ND		ug/kg	0.947	0.473	1
Cl5-BZ#105	ND		ug/kg	0.947	0.473	1
Cl5-BZ#118	ND		ug/kg	0.947	0.473	1
Cl6-BZ#128	ND		ug/kg	0.947	0.473	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-14
 Client ID: B567R01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.40		ug/kg	0.947	0.473	1
CI6-BZ#153	2.06		ug/kg	0.947	0.473	1
CI7-BZ#170	0.537	J	ug/kg	0.947	0.473	1
CI7-BZ#180	1.76		ug/kg	0.947	0.473	1
CI7-BZ#183	0.519	J	ug/kg	0.947	0.473	1
CI7-BZ#184	ND		ug/kg	0.947	0.473	1
CI7-BZ#187	1.51		ug/kg	0.947	0.473	1
CI8-BZ#195	ND		ug/kg	0.947	0.473	1
CI9-BZ#206	ND		ug/kg	0.947	0.473	1
CI10-BZ#209	ND		ug/kg	0.947	0.473	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	74		30-150
Pyrene-d10	78		30-150
Benzo(b)fluoranthene-d12	73		30-150
DBOB	87		30-150
BZ 198	63		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-15
 Client ID: B567R01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 03:20
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:33
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.43	4.72	1
Acenaphthylene	ND		ug/kg	9.43	4.72	1
Acenaphthene	ND		ug/kg	9.43	4.72	1
Fluorene	ND		ug/kg	9.43	4.72	1
Phenanthrene	ND		ug/kg	9.43	4.72	1
Anthracene	ND		ug/kg	9.43	4.72	1
Fluoranthene	ND		ug/kg	9.43	4.72	1
Pyrene	ND		ug/kg	9.43	4.72	1
Benz(a)anthracene	ND		ug/kg	9.43	4.72	1
Chrysene	ND		ug/kg	9.43	4.72	1
Benzo(b)fluoranthene	ND		ug/kg	9.43	4.72	1
Benzo(k)fluoranthene	ND		ug/kg	9.43	4.72	1
Benzo(a)pyrene	ND		ug/kg	9.43	4.72	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.43	4.72	1
Dibenz(a,h)anthracene	ND		ug/kg	9.43	4.72	1
Benzo(ghi)perylene	ND		ug/kg	9.43	4.72	1
Cl2-BZ#8	ND		ug/kg	0.943	0.472	1
Cl3-BZ#18	ND		ug/kg	0.943	0.472	1
Cl3-BZ#28	ND		ug/kg	0.943	0.472	1
Cl4-BZ#44	ND		ug/kg	0.943	0.472	1
Cl4-BZ#49	ND		ug/kg	0.943	0.472	1
Cl4-BZ#52	ND		ug/kg	0.943	0.472	1
Cl4-BZ#66	ND		ug/kg	0.943	0.472	1
Cl5-BZ#87	ND		ug/kg	0.943	0.472	1
Cl5-BZ#101	ND		ug/kg	0.943	0.472	1
Cl5-BZ#105	ND		ug/kg	0.943	0.472	1
Cl5-BZ#118	ND		ug/kg	0.943	0.472	1
Cl6-BZ#128	ND		ug/kg	0.943	0.472	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-15
 Client ID: B567R01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	0.870	J	ug/kg	0.943	0.472	1
Cl6-BZ#153	1.63		ug/kg	0.943	0.472	1
Cl7-BZ#170	ND		ug/kg	0.943	0.472	1
Cl7-BZ#180	1.10		ug/kg	0.943	0.472	1
Cl7-BZ#183	ND		ug/kg	0.943	0.472	1
Cl7-BZ#184	ND		ug/kg	0.943	0.472	1
Cl7-BZ#187	0.660	J	ug/kg	0.943	0.472	1
Cl8-BZ#195	ND		ug/kg	0.943	0.472	1
Cl9-BZ#206	ND		ug/kg	0.943	0.472	1
Cl10-BZ#209	ND		ug/kg	0.943	0.472	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	71		30-150
Pyrene-d10	72		30-150
Benzo(b)fluoranthene-d12	68		30-150
DBOB	79		30-150
BZ 198	57		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-16
 Client ID: B567S01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 03:54
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:26
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.65	4.32	1
Acenaphthylene	ND		ug/kg	8.65	4.32	1
Acenaphthene	ND		ug/kg	8.65	4.32	1
Fluorene	ND		ug/kg	8.65	4.32	1
Phenanthrene	ND		ug/kg	8.65	4.32	1
Anthracene	ND		ug/kg	8.65	4.32	1
Fluoranthene	4.54	J	ug/kg	8.65	4.32	1
Pyrene	ND		ug/kg	8.65	4.32	1
Benz(a)anthracene	ND		ug/kg	8.65	4.32	1
Chrysene	ND		ug/kg	8.65	4.32	1
Benzo(b)fluoranthene	ND		ug/kg	8.65	4.32	1
Benzo(k)fluoranthene	ND		ug/kg	8.65	4.32	1
Benzo(a)pyrene	ND		ug/kg	8.65	4.32	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.65	4.32	1
Dibenz(a,h)anthracene	ND		ug/kg	8.65	4.32	1
Benzo(ghi)perylene	ND		ug/kg	8.65	4.32	1
Cl2-BZ#8	ND		ug/kg	0.865	0.432	1
Cl3-BZ#18	ND		ug/kg	0.865	0.432	1
Cl3-BZ#28	ND		ug/kg	0.865	0.432	1
Cl4-BZ#44	ND		ug/kg	0.865	0.432	1
Cl4-BZ#49	ND		ug/kg	0.865	0.432	1
Cl4-BZ#52	0.501	J	ug/kg	0.865	0.432	1
Cl4-BZ#66	ND		ug/kg	0.865	0.432	1
Cl5-BZ#87	ND		ug/kg	0.865	0.432	1
Cl5-BZ#101	ND		ug/kg	0.865	0.432	1
Cl5-BZ#105	ND		ug/kg	0.865	0.432	1
Cl5-BZ#118	ND		ug/kg	0.865	0.432	1
Cl6-BZ#128	ND		ug/kg	0.865	0.432	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-16
 Client ID: B567S01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.16		ug/kg	0.865	0.432	1
CI6-BZ#153	1.42		ug/kg	0.865	0.432	1
CI7-BZ#170	ND		ug/kg	0.865	0.432	1
CI7-BZ#180	1.21		ug/kg	0.865	0.432	1
CI7-BZ#183	ND		ug/kg	0.865	0.432	1
CI7-BZ#184	ND		ug/kg	0.865	0.432	1
CI7-BZ#187	0.772	J	ug/kg	0.865	0.432	1
CI8-BZ#195	ND		ug/kg	0.865	0.432	1
CI9-BZ#206	ND		ug/kg	0.865	0.432	1
CI10-BZ#209	ND		ug/kg	0.865	0.432	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	72		30-150
Pyrene-d10	82		30-150
Benzo(b)fluoranthene-d12	75		30-150
DBOB	86		30-150
BZ 198	63		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-17
 Client ID: B567S01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 04:28
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:26
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.77	4.38	1
Acenaphthylene	ND		ug/kg	8.77	4.38	1
Acenaphthene	ND		ug/kg	8.77	4.38	1
Fluorene	ND		ug/kg	8.77	4.38	1
Phenanthrene	ND		ug/kg	8.77	4.38	1
Anthracene	ND		ug/kg	8.77	4.38	1
Fluoranthene	6.56	J	ug/kg	8.77	4.38	1
Pyrene	5.06	J	ug/kg	8.77	4.38	1
Benz(a)anthracene	ND		ug/kg	8.77	4.38	1
Chrysene	ND		ug/kg	8.77	4.38	1
Benzo(b)fluoranthene	ND		ug/kg	8.77	4.38	1
Benzo(k)fluoranthene	ND		ug/kg	8.77	4.38	1
Benzo(a)pyrene	ND		ug/kg	8.77	4.38	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.77	4.38	1
Dibenz(a,h)anthracene	ND		ug/kg	8.77	4.38	1
Benzo(ghi)perylene	ND		ug/kg	8.77	4.38	1
Cl2-BZ#8	ND		ug/kg	0.877	0.438	1
Cl3-BZ#18	1.02		ug/kg	0.877	0.438	1
Cl3-BZ#28	ND		ug/kg	0.877	0.438	1
Cl4-BZ#44	ND		ug/kg	0.877	0.438	1
Cl4-BZ#49	ND		ug/kg	0.877	0.438	1
Cl4-BZ#52	0.691	J	ug/kg	0.877	0.438	1
Cl4-BZ#66	ND		ug/kg	0.877	0.438	1
Cl5-BZ#87	ND		ug/kg	0.877	0.438	1
Cl5-BZ#101	0.506	J	ug/kg	0.877	0.438	1
Cl5-BZ#105	0.476	J	ug/kg	0.877	0.438	1
Cl5-BZ#118	ND		ug/kg	0.877	0.438	1
Cl6-BZ#128	0.455	J	ug/kg	0.877	0.438	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-17
 Client ID: B567S01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	3.26		ug/kg	0.877	0.438	1
Cl6-BZ#153	5.46		ug/kg	0.877	0.438	1
Cl7-BZ#170	2.62		ug/kg	0.877	0.438	1
Cl7-BZ#180	5.86		ug/kg	0.877	0.438	1
Cl7-BZ#183	1.38		ug/kg	0.877	0.438	1
Cl7-BZ#184	ND		ug/kg	0.877	0.438	1
Cl7-BZ#187	3.67		ug/kg	0.877	0.438	1
Cl8-BZ#195	ND		ug/kg	0.877	0.438	1
Cl9-BZ#206	ND		ug/kg	0.877	0.438	1
Cl10-BZ#209	ND		ug/kg	0.877	0.438	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-150
Pyrene-d10	83		30-150
Benzo(b)fluoranthene-d12	77		30-150
DBOB	85		30-150
BZ 198	67		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-18
 Client ID: B567S01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 05:02
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:26
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.88	4.94	1
Acenaphthylene	ND		ug/kg	9.88	4.94	1
Acenaphthene	ND		ug/kg	9.88	4.94	1
Fluorene	ND		ug/kg	9.88	4.94	1
Phenanthrene	ND		ug/kg	9.88	4.94	1
Anthracene	ND		ug/kg	9.88	4.94	1
Fluoranthene	6.07	J	ug/kg	9.88	4.94	1
Pyrene	ND		ug/kg	9.88	4.94	1
Benz(a)anthracene	ND		ug/kg	9.88	4.94	1
Chrysene	ND		ug/kg	9.88	4.94	1
Benzo(b)fluoranthene	ND		ug/kg	9.88	4.94	1
Benzo(k)fluoranthene	ND		ug/kg	9.88	4.94	1
Benzo(a)pyrene	ND		ug/kg	9.88	4.94	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.88	4.94	1
Dibenz(a,h)anthracene	ND		ug/kg	9.88	4.94	1
Benzo(ghi)perylene	ND		ug/kg	9.88	4.94	1
Cl2-BZ#8	ND		ug/kg	0.988	0.494	1
Cl3-BZ#18	ND		ug/kg	0.988	0.494	1
Cl3-BZ#28	ND		ug/kg	0.988	0.494	1
Cl4-BZ#44	ND		ug/kg	0.988	0.494	1
Cl4-BZ#49	ND		ug/kg	0.988	0.494	1
Cl4-BZ#52	0.817	J	ug/kg	0.988	0.494	1
Cl4-BZ#66	ND		ug/kg	0.988	0.494	1
Cl5-BZ#87	ND		ug/kg	0.988	0.494	1
Cl5-BZ#101	ND		ug/kg	0.988	0.494	1
Cl5-BZ#105	ND		ug/kg	0.988	0.494	1
Cl5-BZ#118	ND		ug/kg	0.988	0.494	1
Cl6-BZ#128	ND		ug/kg	0.988	0.494	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-18
 Client ID: B567S01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.43		ug/kg	0.988	0.494	1
CI6-BZ#153	1.78		ug/kg	0.988	0.494	1
CI7-BZ#170	ND		ug/kg	0.988	0.494	1
CI7-BZ#180	1.64		ug/kg	0.988	0.494	1
CI7-BZ#183	ND		ug/kg	0.988	0.494	1
CI7-BZ#184	ND		ug/kg	0.988	0.494	1
CI7-BZ#187	0.790	J	ug/kg	0.988	0.494	1
CI8-BZ#195	ND		ug/kg	0.988	0.494	1
CI9-BZ#206	ND		ug/kg	0.988	0.494	1
CI10-BZ#209	ND		ug/kg	0.988	0.494	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	79		30-150
DBOB	91		30-150
BZ 198	68		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-19
 Client ID: B567S01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 05:36
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:26
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.65	4.32	1
Acenaphthylene	ND		ug/kg	8.65	4.32	1
Acenaphthene	ND		ug/kg	8.65	4.32	1
Fluorene	ND		ug/kg	8.65	4.32	1
Phenanthrene	ND		ug/kg	8.65	4.32	1
Anthracene	ND		ug/kg	8.65	4.32	1
Fluoranthene	ND		ug/kg	8.65	4.32	1
Pyrene	ND		ug/kg	8.65	4.32	1
Benz(a)anthracene	ND		ug/kg	8.65	4.32	1
Chrysene	ND		ug/kg	8.65	4.32	1
Benzo(b)fluoranthene	ND		ug/kg	8.65	4.32	1
Benzo(k)fluoranthene	ND		ug/kg	8.65	4.32	1
Benzo(a)pyrene	ND		ug/kg	8.65	4.32	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.65	4.32	1
Dibenz(a,h)anthracene	ND		ug/kg	8.65	4.32	1
Benzo(ghi)perylene	ND		ug/kg	8.65	4.32	1
Cl2-BZ#8	ND		ug/kg	0.865	0.432	1
Cl3-BZ#18	ND		ug/kg	0.865	0.432	1
Cl3-BZ#28	ND		ug/kg	0.865	0.432	1
Cl4-BZ#44	ND		ug/kg	0.865	0.432	1
Cl4-BZ#49	ND		ug/kg	0.865	0.432	1
Cl4-BZ#52	0.528	J	ug/kg	0.865	0.432	1
Cl4-BZ#66	ND		ug/kg	0.865	0.432	1
Cl5-BZ#87	ND		ug/kg	0.865	0.432	1
Cl5-BZ#101	ND		ug/kg	0.865	0.432	1
Cl5-BZ#105	ND		ug/kg	0.865	0.432	1
Cl5-BZ#118	ND		ug/kg	0.865	0.432	1
Cl6-BZ#128	ND		ug/kg	0.865	0.432	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-19
 Client ID: B567S01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.90		ug/kg	0.865	0.432	1
CI6-BZ#153	3.31		ug/kg	0.865	0.432	1
CI7-BZ#170	0.830	J	ug/kg	0.865	0.432	1
CI7-BZ#180	3.46		ug/kg	0.865	0.432	1
CI7-BZ#183	0.999		ug/kg	0.865	0.432	1
CI7-BZ#184	ND		ug/kg	0.865	0.432	1
CI7-BZ#187	2.38		ug/kg	0.865	0.432	1
CI8-BZ#195	ND		ug/kg	0.865	0.432	1
CI9-BZ#206	ND		ug/kg	0.865	0.432	1
CI10-BZ#209	ND		ug/kg	0.865	0.432	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-150
Pyrene-d10	81		30-150
Benzo(b)fluoranthene-d12	76		30-150
DBOB	84		30-150
BZ 198	66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-20
 Client ID: B567S01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 06:10
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:26
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.76	4.88	1
Acenaphthylene	ND		ug/kg	9.76	4.88	1
Acenaphthene	ND		ug/kg	9.76	4.88	1
Fluorene	ND		ug/kg	9.76	4.88	1
Phenanthrene	ND		ug/kg	9.76	4.88	1
Anthracene	ND		ug/kg	9.76	4.88	1
Fluoranthene	ND		ug/kg	9.76	4.88	1
Pyrene	ND		ug/kg	9.76	4.88	1
Benz(a)anthracene	ND		ug/kg	9.76	4.88	1
Chrysene	ND		ug/kg	9.76	4.88	1
Benzo(b)fluoranthene	ND		ug/kg	9.76	4.88	1
Benzo(k)fluoranthene	ND		ug/kg	9.76	4.88	1
Benzo(a)pyrene	ND		ug/kg	9.76	4.88	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.76	4.88	1
Dibenz(a,h)anthracene	ND		ug/kg	9.76	4.88	1
Benzo(ghi)perylene	ND		ug/kg	9.76	4.88	1
Cl2-BZ#8	ND		ug/kg	0.976	0.488	1
Cl3-BZ#18	ND		ug/kg	0.976	0.488	1
Cl3-BZ#28	ND		ug/kg	0.976	0.488	1
Cl4-BZ#44	ND		ug/kg	0.976	0.488	1
Cl4-BZ#49	ND		ug/kg	0.976	0.488	1
Cl4-BZ#52	0.636	J	ug/kg	0.976	0.488	1
Cl4-BZ#66	ND		ug/kg	0.976	0.488	1
Cl5-BZ#87	ND		ug/kg	0.976	0.488	1
Cl5-BZ#101	0.602	J	ug/kg	0.976	0.488	1
Cl5-BZ#105	ND		ug/kg	0.976	0.488	1
Cl5-BZ#118	ND		ug/kg	0.976	0.488	1
Cl6-BZ#128	ND		ug/kg	0.976	0.488	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-20
 Client ID: B567S01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	1.90		ug/kg	0.976	0.488	1
Cl6-BZ#153	3.30		ug/kg	0.976	0.488	1
Cl7-BZ#170	1.43		ug/kg	0.976	0.488	1
Cl7-BZ#180	3.23		ug/kg	0.976	0.488	1
Cl7-BZ#183	0.989		ug/kg	0.976	0.488	1
Cl7-BZ#184	ND		ug/kg	0.976	0.488	1
Cl7-BZ#187	1.68		ug/kg	0.976	0.488	1
Cl8-BZ#195	ND		ug/kg	0.976	0.488	1
Cl9-BZ#206	ND		ug/kg	0.976	0.488	1
Cl10-BZ#209	ND		ug/kg	0.976	0.488	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	69		30-150
Pyrene-d10	78		30-150
Benzo(b)fluoranthene-d12	72		30-150
DBOB	83		30-150
BZ 198	68		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-21
 Client ID: B567S02NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 06:44
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.98	4.49	1
Acenaphthylene	ND		ug/kg	8.98	4.49	1
Acenaphthene	ND		ug/kg	8.98	4.49	1
Fluorene	ND		ug/kg	8.98	4.49	1
Phenanthrene	ND		ug/kg	8.98	4.49	1
Anthracene	ND		ug/kg	8.98	4.49	1
Fluoranthene	10.0		ug/kg	8.98	4.49	1
Pyrene	7.18	J	ug/kg	8.98	4.49	1
Benz(a)anthracene	ND		ug/kg	8.98	4.49	1
Chrysene	ND		ug/kg	8.98	4.49	1
Benzo(b)fluoranthene	ND		ug/kg	8.98	4.49	1
Benzo(k)fluoranthene	ND		ug/kg	8.98	4.49	1
Benzo(a)pyrene	ND		ug/kg	8.98	4.49	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.98	4.49	1
Dibenz(a,h)anthracene	ND		ug/kg	8.98	4.49	1
Benzo(ghi)perylene	ND		ug/kg	8.98	4.49	1
Cl2-BZ#8	ND		ug/kg	0.898	0.449	1
Cl3-BZ#18	ND		ug/kg	0.898	0.449	1
Cl3-BZ#28	ND		ug/kg	0.898	0.449	1
Cl4-BZ#44	ND		ug/kg	0.898	0.449	1
Cl4-BZ#49	ND		ug/kg	0.898	0.449	1
Cl4-BZ#52	0.594	J	ug/kg	0.898	0.449	1
Cl4-BZ#66	ND		ug/kg	0.898	0.449	1
Cl5-BZ#87	ND		ug/kg	0.898	0.449	1
Cl5-BZ#101	0.633	J	ug/kg	0.898	0.449	1
Cl5-BZ#105	0.585	J	ug/kg	0.898	0.449	1
Cl5-BZ#118	ND		ug/kg	0.898	0.449	1
Cl6-BZ#128	ND		ug/kg	0.898	0.449	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-21
 Client ID: B567S02NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	3.44		ug/kg	0.898	0.449	1
Cl6-BZ#153	5.83		ug/kg	0.898	0.449	1
Cl7-BZ#170	2.28		ug/kg	0.898	0.449	1
Cl7-BZ#180	5.56		ug/kg	0.898	0.449	1
Cl7-BZ#183	1.70		ug/kg	0.898	0.449	1
Cl7-BZ#184	ND		ug/kg	0.898	0.449	1
Cl7-BZ#187	3.81		ug/kg	0.898	0.449	1
Cl8-BZ#195	0.693	J	ug/kg	0.898	0.449	1
Cl9-BZ#206	ND		ug/kg	0.898	0.449	1
Cl10-BZ#209	ND		ug/kg	0.898	0.449	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	72		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	76		30-150
DBOB	92		30-150
BZ 198	74		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-22
 Client ID: B567S02NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 10:35
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.69	4.84	1
Acenaphthylene	ND		ug/kg	9.69	4.84	1
Acenaphthene	ND		ug/kg	9.69	4.84	1
Fluorene	ND		ug/kg	9.69	4.84	1
Phenanthrene	ND		ug/kg	9.69	4.84	1
Anthracene	ND		ug/kg	9.69	4.84	1
Fluoranthene	8.77	J	ug/kg	9.69	4.84	1
Pyrene	6.21	J	ug/kg	9.69	4.84	1
Benz(a)anthracene	ND		ug/kg	9.69	4.84	1
Chrysene	ND		ug/kg	9.69	4.84	1
Benzo(b)fluoranthene	ND		ug/kg	9.69	4.84	1
Benzo(k)fluoranthene	ND		ug/kg	9.69	4.84	1
Benzo(a)pyrene	ND		ug/kg	9.69	4.84	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.69	4.84	1
Dibenz(a,h)anthracene	ND		ug/kg	9.69	4.84	1
Benzo(ghi)perylene	ND		ug/kg	9.69	4.84	1
Cl2-BZ#8	ND		ug/kg	0.969	0.484	1
Cl3-BZ#18	ND		ug/kg	0.969	0.484	1
Cl3-BZ#28	ND		ug/kg	0.969	0.484	1
Cl4-BZ#44	ND		ug/kg	0.969	0.484	1
Cl4-BZ#49	ND		ug/kg	0.969	0.484	1
Cl4-BZ#52	ND		ug/kg	0.969	0.484	1
Cl4-BZ#66	ND		ug/kg	0.969	0.484	1
Cl5-BZ#87	ND		ug/kg	0.969	0.484	1
Cl5-BZ#101	0.566	J	ug/kg	0.969	0.484	1
Cl5-BZ#105	ND		ug/kg	0.969	0.484	1
Cl5-BZ#118	ND		ug/kg	0.969	0.484	1
Cl6-BZ#128	ND		ug/kg	0.969	0.484	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-22
 Client ID: B567S02NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.88		ug/kg	0.969	0.484	1
CI6-BZ#153	3.15		ug/kg	0.969	0.484	1
CI7-BZ#170	1.13		ug/kg	0.969	0.484	1
CI7-BZ#180	2.76		ug/kg	0.969	0.484	1
CI7-BZ#183	0.758	J	ug/kg	0.969	0.484	1
CI7-BZ#184	ND		ug/kg	0.969	0.484	1
CI7-BZ#187	2.04		ug/kg	0.969	0.484	1
CI8-BZ#195	ND		ug/kg	0.969	0.484	1
CI9-BZ#206	ND		ug/kg	0.969	0.484	1
CI10-BZ#209	ND		ug/kg	0.969	0.484	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	62		30-150
Pyrene-d10	72		30-150
Benzo(b)fluoranthene-d12	74		30-150
DBOB	78		30-150
BZ 198	63		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-23
 Client ID: B567S02NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 11:45
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.64	4.32	1
Acenaphthylene	ND		ug/kg	8.64	4.32	1
Acenaphthene	ND		ug/kg	8.64	4.32	1
Fluorene	ND		ug/kg	8.64	4.32	1
Phenanthrene	ND		ug/kg	8.64	4.32	1
Anthracene	ND		ug/kg	8.64	4.32	1
Fluoranthene	6.59	J	ug/kg	8.64	4.32	1
Pyrene	4.98	J	ug/kg	8.64	4.32	1
Benz(a)anthracene	ND		ug/kg	8.64	4.32	1
Chrysene	ND		ug/kg	8.64	4.32	1
Benzo(b)fluoranthene	ND		ug/kg	8.64	4.32	1
Benzo(k)fluoranthene	ND		ug/kg	8.64	4.32	1
Benzo(a)pyrene	ND		ug/kg	8.64	4.32	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.64	4.32	1
Dibenz(a,h)anthracene	ND		ug/kg	8.64	4.32	1
Benzo(ghi)perylene	ND		ug/kg	8.64	4.32	1
Cl2-BZ#8	ND		ug/kg	0.864	0.432	1
Cl3-BZ#18	ND		ug/kg	0.864	0.432	1
Cl3-BZ#28	ND		ug/kg	0.864	0.432	1
Cl4-BZ#44	ND		ug/kg	0.864	0.432	1
Cl4-BZ#49	ND		ug/kg	0.864	0.432	1
Cl4-BZ#52	ND		ug/kg	0.864	0.432	1
Cl4-BZ#66	ND		ug/kg	0.864	0.432	1
Cl5-BZ#87	ND		ug/kg	0.864	0.432	1
Cl5-BZ#101	0.596	J	ug/kg	0.864	0.432	1
Cl5-BZ#105	ND		ug/kg	0.864	0.432	1
Cl5-BZ#118	ND		ug/kg	0.864	0.432	1
Cl6-BZ#128	ND		ug/kg	0.864	0.432	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-23
 Client ID: B567S02NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.13		ug/kg	0.864	0.432	1
CI6-BZ#153	1.67		ug/kg	0.864	0.432	1
CI7-BZ#170	ND		ug/kg	0.864	0.432	1
CI7-BZ#180	1.33		ug/kg	0.864	0.432	1
CI7-BZ#183	0.442	J	ug/kg	0.864	0.432	1
CI7-BZ#184	ND		ug/kg	0.864	0.432	1
CI7-BZ#187	0.882		ug/kg	0.864	0.432	1
CI8-BZ#195	ND		ug/kg	0.864	0.432	1
CI9-BZ#206	ND		ug/kg	0.864	0.432	1
CI10-BZ#209	ND		ug/kg	0.864	0.432	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	54		30-150
Pyrene-d10	60		30-150
Benzo(b)fluoranthene-d12	54		30-150
DBOB	65		30-150
BZ 198	51		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-24
 Client ID: B567S02NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 12:19
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.94	4.97	1
Acenaphthylene	ND		ug/kg	9.94	4.97	1
Acenaphthene	ND		ug/kg	9.94	4.97	1
Fluorene	ND		ug/kg	9.94	4.97	1
Phenanthrene	ND		ug/kg	9.94	4.97	1
Anthracene	ND		ug/kg	9.94	4.97	1
Fluoranthene	6.49	J	ug/kg	9.94	4.97	1
Pyrene	ND		ug/kg	9.94	4.97	1
Benz(a)anthracene	ND		ug/kg	9.94	4.97	1
Chrysene	ND		ug/kg	9.94	4.97	1
Benzo(b)fluoranthene	ND		ug/kg	9.94	4.97	1
Benzo(k)fluoranthene	ND		ug/kg	9.94	4.97	1
Benzo(a)pyrene	ND		ug/kg	9.94	4.97	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.94	4.97	1
Dibenz(a,h)anthracene	ND		ug/kg	9.94	4.97	1
Benzo(ghi)perylene	ND		ug/kg	9.94	4.97	1
Cl2-BZ#8	ND		ug/kg	0.994	0.497	1
Cl3-BZ#18	ND		ug/kg	0.994	0.497	1
Cl3-BZ#28	ND		ug/kg	0.994	0.497	1
Cl4-BZ#44	ND		ug/kg	0.994	0.497	1
Cl4-BZ#49	ND		ug/kg	0.994	0.497	1
Cl4-BZ#52	ND		ug/kg	0.994	0.497	1
Cl4-BZ#66	ND		ug/kg	0.994	0.497	1
Cl5-BZ#87	ND		ug/kg	0.994	0.497	1
Cl5-BZ#101	ND		ug/kg	0.994	0.497	1
Cl5-BZ#105	ND		ug/kg	0.994	0.497	1
Cl5-BZ#118	ND		ug/kg	0.994	0.497	1
Cl6-BZ#128	ND		ug/kg	0.994	0.497	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-24
 Client ID: B567S02NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.57		ug/kg	0.994	0.497	1
CI6-BZ#153	2.53		ug/kg	0.994	0.497	1
CI7-BZ#170	0.856	J	ug/kg	0.994	0.497	1
CI7-BZ#180	2.59		ug/kg	0.994	0.497	1
CI7-BZ#183	0.872	J	ug/kg	0.994	0.497	1
CI7-BZ#184	ND		ug/kg	0.994	0.497	1
CI7-BZ#187	1.91		ug/kg	0.994	0.497	1
CI8-BZ#195	ND		ug/kg	0.994	0.497	1
CI9-BZ#206	ND		ug/kg	0.994	0.497	1
CI10-BZ#209	ND		ug/kg	0.994	0.497	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	56		30-150
Pyrene-d10	67		30-150
Benzo(b)fluoranthene-d12	62		30-150
DBOB	70		30-150
BZ 198	62		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-25
 Client ID: B567S02NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 12:54
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.60	4.80	1
Acenaphthylene	ND		ug/kg	9.60	4.80	1
Acenaphthene	ND		ug/kg	9.60	4.80	1
Fluorene	ND		ug/kg	9.60	4.80	1
Phenanthrene	ND		ug/kg	9.60	4.80	1
Anthracene	ND		ug/kg	9.60	4.80	1
Fluoranthene	ND		ug/kg	9.60	4.80	1
Pyrene	ND		ug/kg	9.60	4.80	1
Benz(a)anthracene	ND		ug/kg	9.60	4.80	1
Chrysene	ND		ug/kg	9.60	4.80	1
Benzo(b)fluoranthene	ND		ug/kg	9.60	4.80	1
Benzo(k)fluoranthene	ND		ug/kg	9.60	4.80	1
Benzo(a)pyrene	ND		ug/kg	9.60	4.80	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.60	4.80	1
Dibenz(a,h)anthracene	ND		ug/kg	9.60	4.80	1
Benzo(ghi)perylene	ND		ug/kg	9.60	4.80	1
Cl2-BZ#8	ND		ug/kg	0.960	0.480	1
Cl3-BZ#18	ND		ug/kg	0.960	0.480	1
Cl3-BZ#28	ND		ug/kg	0.960	0.480	1
Cl4-BZ#44	ND		ug/kg	0.960	0.480	1
Cl4-BZ#49	ND		ug/kg	0.960	0.480	1
Cl4-BZ#52	ND		ug/kg	0.960	0.480	1
Cl4-BZ#66	ND		ug/kg	0.960	0.480	1
Cl5-BZ#87	ND		ug/kg	0.960	0.480	1
Cl5-BZ#101	ND		ug/kg	0.960	0.480	1
Cl5-BZ#105	ND		ug/kg	0.960	0.480	1
Cl5-BZ#118	ND		ug/kg	0.960	0.480	1
Cl6-BZ#128	ND		ug/kg	0.960	0.480	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-25
 Client ID: B567S02NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.15		ug/kg	0.960	0.480	1
CI6-BZ#153	1.94		ug/kg	0.960	0.480	1
CI7-BZ#170	ND		ug/kg	0.960	0.480	1
CI7-BZ#180	1.61		ug/kg	0.960	0.480	1
CI7-BZ#183	0.564	J	ug/kg	0.960	0.480	1
CI7-BZ#184	ND		ug/kg	0.960	0.480	1
CI7-BZ#187	1.12		ug/kg	0.960	0.480	1
CI8-BZ#195	ND		ug/kg	0.960	0.480	1
CI9-BZ#206	ND		ug/kg	0.960	0.480	1
CI10-BZ#209	ND		ug/kg	0.960	0.480	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	59		30-150
Pyrene-d10	67		30-150
Benzo(b)fluoranthene-d12	63		30-150
DBOB	72		30-150
BZ 198	61		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-26
 Client ID: B567S03NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 13:28
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.94	4.47	1
Acenaphthylene	ND		ug/kg	8.94	4.47	1
Acenaphthene	ND		ug/kg	8.94	4.47	1
Fluorene	ND		ug/kg	8.94	4.47	1
Phenanthrene	ND		ug/kg	8.94	4.47	1
Anthracene	ND		ug/kg	8.94	4.47	1
Fluoranthene	7.25	J	ug/kg	8.94	4.47	1
Pyrene	6.42	J	ug/kg	8.94	4.47	1
Benz(a)anthracene	ND		ug/kg	8.94	4.47	1
Chrysene	ND		ug/kg	8.94	4.47	1
Benzo(b)fluoranthene	ND		ug/kg	8.94	4.47	1
Benzo(k)fluoranthene	ND		ug/kg	8.94	4.47	1
Benzo(a)pyrene	ND		ug/kg	8.94	4.47	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.94	4.47	1
Dibenz(a,h)anthracene	ND		ug/kg	8.94	4.47	1
Benzo(ghi)perylene	ND		ug/kg	8.94	4.47	1
Cl2-BZ#8	ND		ug/kg	0.894	0.447	1
Cl3-BZ#18	1.69		ug/kg	0.894	0.447	1
Cl3-BZ#28	ND		ug/kg	0.894	0.447	1
Cl4-BZ#44	ND		ug/kg	0.894	0.447	1
Cl4-BZ#49	ND		ug/kg	0.894	0.447	1
Cl4-BZ#52	0.820	J	ug/kg	0.894	0.447	1
Cl4-BZ#66	ND		ug/kg	0.894	0.447	1
Cl5-BZ#87	ND		ug/kg	0.894	0.447	1
Cl5-BZ#101	0.714	J	ug/kg	0.894	0.447	1
Cl5-BZ#105	ND		ug/kg	0.894	0.447	1
Cl5-BZ#118	ND		ug/kg	0.894	0.447	1
Cl6-BZ#128	ND		ug/kg	0.894	0.447	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-26
 Client ID: B567S03NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	2.36		ug/kg	0.894	0.447	1
Cl6-BZ#153	3.82		ug/kg	0.894	0.447	1
Cl7-BZ#170	1.33		ug/kg	0.894	0.447	1
Cl7-BZ#180	3.56		ug/kg	0.894	0.447	1
Cl7-BZ#183	0.957		ug/kg	0.894	0.447	1
Cl7-BZ#184	ND		ug/kg	0.894	0.447	1
Cl7-BZ#187	2.37		ug/kg	0.894	0.447	1
Cl8-BZ#195	ND		ug/kg	0.894	0.447	1
Cl9-BZ#206	ND		ug/kg	0.894	0.447	1
Cl10-BZ#209	ND		ug/kg	0.894	0.447	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-150
Pyrene-d10	83		30-150
Benzo(b)fluoranthene-d12	76		30-150
DBOB	86		30-150
BZ 198	71		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-27
 Client ID: B567S03NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 14:03
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.07	4.54	1
Acenaphthylene	ND		ug/kg	9.07	4.54	1
Acenaphthene	ND		ug/kg	9.07	4.54	1
Fluorene	ND		ug/kg	9.07	4.54	1
Phenanthrene	ND		ug/kg	9.07	4.54	1
Anthracene	ND		ug/kg	9.07	4.54	1
Fluoranthene	5.19	J	ug/kg	9.07	4.54	1
Pyrene	ND		ug/kg	9.07	4.54	1
Benz(a)anthracene	ND		ug/kg	9.07	4.54	1
Chrysene	ND		ug/kg	9.07	4.54	1
Benzo(b)fluoranthene	ND		ug/kg	9.07	4.54	1
Benzo(k)fluoranthene	ND		ug/kg	9.07	4.54	1
Benzo(a)pyrene	ND		ug/kg	9.07	4.54	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.07	4.54	1
Dibenz(a,h)anthracene	ND		ug/kg	9.07	4.54	1
Benzo(ghi)perylene	ND		ug/kg	9.07	4.54	1
Cl2-BZ#8	ND		ug/kg	0.907	0.454	1
Cl3-BZ#18	1.26		ug/kg	0.907	0.454	1
Cl3-BZ#28	ND		ug/kg	0.907	0.454	1
Cl4-BZ#44	ND		ug/kg	0.907	0.454	1
Cl4-BZ#49	ND		ug/kg	0.907	0.454	1
Cl4-BZ#52	1.14		ug/kg	0.907	0.454	1
Cl4-BZ#66	ND		ug/kg	0.907	0.454	1
Cl5-BZ#87	ND		ug/kg	0.907	0.454	1
Cl5-BZ#101	0.685	J	ug/kg	0.907	0.454	1
Cl5-BZ#105	ND		ug/kg	0.907	0.454	1
Cl5-BZ#118	ND		ug/kg	0.907	0.454	1
Cl6-BZ#128	ND		ug/kg	0.907	0.454	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-27
 Client ID: B567S03NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	2.08		ug/kg	0.907	0.454	1
Cl6-BZ#153	2.63		ug/kg	0.907	0.454	1
Cl7-BZ#170	ND		ug/kg	0.907	0.454	1
Cl7-BZ#180	2.08		ug/kg	0.907	0.454	1
Cl7-BZ#183	0.763	J	ug/kg	0.907	0.454	1
Cl7-BZ#184	ND		ug/kg	0.907	0.454	1
Cl7-BZ#187	1.68		ug/kg	0.907	0.454	1
Cl8-BZ#195	ND		ug/kg	0.907	0.454	1
Cl9-BZ#206	ND		ug/kg	0.907	0.454	1
Cl10-BZ#209	ND		ug/kg	0.907	0.454	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	57		30-150
Pyrene-d10	63		30-150
Benzo(b)fluoranthene-d12	58		30-150
DBOB	82		30-150
BZ 198	67		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-28
 Client ID: B567S03NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 14:37
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.86	4.43	1
Acenaphthylene	ND		ug/kg	8.86	4.43	1
Acenaphthene	ND		ug/kg	8.86	4.43	1
Fluorene	ND		ug/kg	8.86	4.43	1
Phenanthrene	ND		ug/kg	8.86	4.43	1
Anthracene	ND		ug/kg	8.86	4.43	1
Fluoranthene	9.86		ug/kg	8.86	4.43	1
Pyrene	7.10	J	ug/kg	8.86	4.43	1
Benz(a)anthracene	ND		ug/kg	8.86	4.43	1
Chrysene	ND		ug/kg	8.86	4.43	1
Benzo(b)fluoranthene	ND		ug/kg	8.86	4.43	1
Benzo(k)fluoranthene	ND		ug/kg	8.86	4.43	1
Benzo(a)pyrene	ND		ug/kg	8.86	4.43	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.86	4.43	1
Dibenz(a,h)anthracene	ND		ug/kg	8.86	4.43	1
Benzo(ghi)perylene	ND		ug/kg	8.86	4.43	1
Cl2-BZ#8	1.71		ug/kg	0.886	0.443	1
Cl3-BZ#18	2.05		ug/kg	0.886	0.443	1
Cl3-BZ#28	ND		ug/kg	0.886	0.443	1
Cl4-BZ#44	ND		ug/kg	0.886	0.443	1
Cl4-BZ#49	1.30		ug/kg	0.886	0.443	1
Cl4-BZ#52	1.07		ug/kg	0.886	0.443	1
Cl4-BZ#66	ND		ug/kg	0.886	0.443	1
Cl5-BZ#87	ND		ug/kg	0.886	0.443	1
Cl5-BZ#101	0.993		ug/kg	0.886	0.443	1
Cl5-BZ#105	ND		ug/kg	0.886	0.443	1
Cl5-BZ#118	ND		ug/kg	0.886	0.443	1
Cl6-BZ#128	ND		ug/kg	0.886	0.443	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-28
 Client ID: B567S03NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	1.94		ug/kg	0.886	0.443	1
Cl6-BZ#153	2.40		ug/kg	0.886	0.443	1
Cl7-BZ#170	ND		ug/kg	0.886	0.443	1
Cl7-BZ#180	1.60		ug/kg	0.886	0.443	1
Cl7-BZ#183	0.598	J	ug/kg	0.886	0.443	1
Cl7-BZ#184	ND		ug/kg	0.886	0.443	1
Cl7-BZ#187	1.59		ug/kg	0.886	0.443	1
Cl8-BZ#195	ND		ug/kg	0.886	0.443	1
Cl9-BZ#206	ND		ug/kg	0.886	0.443	1
Cl10-BZ#209	ND		ug/kg	0.886	0.443	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	93		30-150
BZ 198	80		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-29
 Client ID: B567S03NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 15:11
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.17	4.59	1
Acenaphthylene	ND		ug/kg	9.17	4.59	1
Acenaphthene	ND		ug/kg	9.17	4.59	1
Fluorene	ND		ug/kg	9.17	4.59	1
Phenanthrene	ND		ug/kg	9.17	4.59	1
Anthracene	ND		ug/kg	9.17	4.59	1
Fluoranthene	ND		ug/kg	9.17	4.59	1
Pyrene	ND		ug/kg	9.17	4.59	1
Benz(a)anthracene	ND		ug/kg	9.17	4.59	1
Chrysene	ND		ug/kg	9.17	4.59	1
Benzo(b)fluoranthene	ND		ug/kg	9.17	4.59	1
Benzo(k)fluoranthene	ND		ug/kg	9.17	4.59	1
Benzo(a)pyrene	ND		ug/kg	9.17	4.59	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.17	4.59	1
Dibenz(a,h)anthracene	ND		ug/kg	9.17	4.59	1
Benzo(ghi)perylene	ND		ug/kg	9.17	4.59	1
Cl2-BZ#8	ND		ug/kg	0.917	0.459	1
Cl3-BZ#18	ND		ug/kg	0.917	0.459	1
Cl3-BZ#28	ND		ug/kg	0.917	0.459	1
Cl4-BZ#44	ND		ug/kg	0.917	0.459	1
Cl4-BZ#49	ND		ug/kg	0.917	0.459	1
Cl4-BZ#52	0.614	J	ug/kg	0.917	0.459	1
Cl4-BZ#66	ND		ug/kg	0.917	0.459	1
Cl5-BZ#87	ND		ug/kg	0.917	0.459	1
Cl5-BZ#101	ND		ug/kg	0.917	0.459	1
Cl5-BZ#105	ND		ug/kg	0.917	0.459	1
Cl5-BZ#118	ND		ug/kg	0.917	0.459	1
Cl6-BZ#128	ND		ug/kg	0.917	0.459	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-29
 Client ID: B567S03NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.39		ug/kg	0.917	0.459	1
CI6-BZ#153	2.42		ug/kg	0.917	0.459	1
CI7-BZ#170	ND		ug/kg	0.917	0.459	1
CI7-BZ#180	1.70		ug/kg	0.917	0.459	1
CI7-BZ#183	0.577	J	ug/kg	0.917	0.459	1
CI7-BZ#184	ND		ug/kg	0.917	0.459	1
CI7-BZ#187	1.60		ug/kg	0.917	0.459	1
CI8-BZ#195	ND		ug/kg	0.917	0.459	1
CI9-BZ#206	ND		ug/kg	0.917	0.459	1
CI10-BZ#209	ND		ug/kg	0.917	0.459	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	63		30-150
Pyrene-d10	73		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	78		30-150
BZ 198	68		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-30
 Client ID: B567S03NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 15:46
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.86	4.43	1
Acenaphthylene	ND		ug/kg	8.86	4.43	1
Acenaphthene	ND		ug/kg	8.86	4.43	1
Fluorene	ND		ug/kg	8.86	4.43	1
Phenanthrene	ND		ug/kg	8.86	4.43	1
Anthracene	ND		ug/kg	8.86	4.43	1
Fluoranthene	10.2		ug/kg	8.86	4.43	1
Pyrene	7.60	J	ug/kg	8.86	4.43	1
Benz(a)anthracene	ND		ug/kg	8.86	4.43	1
Chrysene	ND		ug/kg	8.86	4.43	1
Benzo(b)fluoranthene	ND		ug/kg	8.86	4.43	1
Benzo(k)fluoranthene	ND		ug/kg	8.86	4.43	1
Benzo(a)pyrene	ND		ug/kg	8.86	4.43	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	8.86	4.43	1
Dibenz(a,h)anthracene	ND		ug/kg	8.86	4.43	1
Benzo(ghi)perylene	ND		ug/kg	8.86	4.43	1
Cl2-BZ#8	ND		ug/kg	0.886	0.443	1
Cl3-BZ#18	ND		ug/kg	0.886	0.443	1
Cl3-BZ#28	ND		ug/kg	0.886	0.443	1
Cl4-BZ#44	ND		ug/kg	0.886	0.443	1
Cl4-BZ#49	ND		ug/kg	0.886	0.443	1
Cl4-BZ#52	1.25		ug/kg	0.886	0.443	1
Cl4-BZ#66	ND		ug/kg	0.886	0.443	1
Cl5-BZ#87	ND		ug/kg	0.886	0.443	1
Cl5-BZ#101	1.27		ug/kg	0.886	0.443	1
Cl5-BZ#105	ND		ug/kg	0.886	0.443	1
Cl5-BZ#118	ND		ug/kg	0.886	0.443	1
Cl6-BZ#128	ND		ug/kg	0.886	0.443	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-30
 Client ID: B567S03NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	5.00		ug/kg	0.886	0.443	1
Cl6-BZ#153	7.49		ug/kg	0.886	0.443	1
Cl7-BZ#170	3.51		ug/kg	0.886	0.443	1
Cl7-BZ#180	7.35		ug/kg	0.886	0.443	1
Cl7-BZ#183	2.09		ug/kg	0.886	0.443	1
Cl7-BZ#184	ND		ug/kg	0.886	0.443	1
Cl7-BZ#187	4.82		ug/kg	0.886	0.443	1
Cl8-BZ#195	ND		ug/kg	0.886	0.443	1
Cl9-BZ#206	ND		ug/kg	0.886	0.443	1
Cl10-BZ#209	ND		ug/kg	0.886	0.443	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-150
Pyrene-d10	95		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	103		30-150
BZ 198	86		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-31
 Client ID: B567S04NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 16:20
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.65	4.83	1
Acenaphthylene	ND		ug/kg	9.65	4.83	1
Acenaphthene	ND		ug/kg	9.65	4.83	1
Fluorene	ND		ug/kg	9.65	4.83	1
Phenanthrene	ND		ug/kg	9.65	4.83	1
Anthracene	ND		ug/kg	9.65	4.83	1
Fluoranthene	ND		ug/kg	9.65	4.83	1
Pyrene	ND		ug/kg	9.65	4.83	1
Benz(a)anthracene	ND		ug/kg	9.65	4.83	1
Chrysene	ND		ug/kg	9.65	4.83	1
Benzo(b)fluoranthene	ND		ug/kg	9.65	4.83	1
Benzo(k)fluoranthene	ND		ug/kg	9.65	4.83	1
Benzo(a)pyrene	ND		ug/kg	9.65	4.83	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.65	4.83	1
Dibenz(a,h)anthracene	ND		ug/kg	9.65	4.83	1
Benzo(ghi)perylene	ND		ug/kg	9.65	4.83	1
Cl2-BZ#8	ND		ug/kg	0.965	0.483	1
Cl3-BZ#18	ND		ug/kg	0.965	0.483	1
Cl3-BZ#28	ND		ug/kg	0.965	0.483	1
Cl4-BZ#44	ND		ug/kg	0.965	0.483	1
Cl4-BZ#49	ND		ug/kg	0.965	0.483	1
Cl4-BZ#52	ND		ug/kg	0.965	0.483	1
Cl4-BZ#66	ND		ug/kg	0.965	0.483	1
Cl5-BZ#87	ND		ug/kg	0.965	0.483	1
Cl5-BZ#101	0.644	J	ug/kg	0.965	0.483	1
Cl5-BZ#105	ND		ug/kg	0.965	0.483	1
Cl5-BZ#118	ND		ug/kg	0.965	0.483	1
Cl6-BZ#128	ND		ug/kg	0.965	0.483	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-31
 Client ID: B567S04NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	2.45		ug/kg	0.965	0.483	1
CI6-BZ#153	3.69		ug/kg	0.965	0.483	1
CI7-BZ#170	1.50		ug/kg	0.965	0.483	1
CI7-BZ#180	3.65		ug/kg	0.965	0.483	1
CI7-BZ#183	1.13		ug/kg	0.965	0.483	1
CI7-BZ#184	ND		ug/kg	0.965	0.483	1
CI7-BZ#187	2.40		ug/kg	0.965	0.483	1
CI8-BZ#195	ND		ug/kg	0.965	0.483	1
CI9-BZ#206	ND		ug/kg	0.965	0.483	1
CI10-BZ#209	ND		ug/kg	0.965	0.483	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	67		30-150
Pyrene-d10	76		30-150
Benzo(b)fluoranthene-d12	70		30-150
DBOB	81		30-150
BZ 198	66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-32
 Client ID: B567S04NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 16:55
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.33	4.66	1
Acenaphthylene	ND		ug/kg	9.33	4.66	1
Acenaphthene	ND		ug/kg	9.33	4.66	1
Fluorene	ND		ug/kg	9.33	4.66	1
Phenanthrene	ND		ug/kg	9.33	4.66	1
Anthracene	ND		ug/kg	9.33	4.66	1
Fluoranthene	ND		ug/kg	9.33	4.66	1
Pyrene	ND		ug/kg	9.33	4.66	1
Benz(a)anthracene	ND		ug/kg	9.33	4.66	1
Chrysene	ND		ug/kg	9.33	4.66	1
Benzo(b)fluoranthene	ND		ug/kg	9.33	4.66	1
Benzo(k)fluoranthene	ND		ug/kg	9.33	4.66	1
Benzo(a)pyrene	ND		ug/kg	9.33	4.66	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.33	4.66	1
Dibenz(a,h)anthracene	ND		ug/kg	9.33	4.66	1
Benzo(ghi)perylene	ND		ug/kg	9.33	4.66	1
Cl2-BZ#8	ND		ug/kg	0.933	0.466	1
Cl3-BZ#18	ND		ug/kg	0.933	0.466	1
Cl3-BZ#28	ND		ug/kg	0.933	0.466	1
Cl4-BZ#44	ND		ug/kg	0.933	0.466	1
Cl4-BZ#49	ND		ug/kg	0.933	0.466	1
Cl4-BZ#52	ND		ug/kg	0.933	0.466	1
Cl4-BZ#66	ND		ug/kg	0.933	0.466	1
Cl5-BZ#87	ND		ug/kg	0.933	0.466	1
Cl5-BZ#101	ND		ug/kg	0.933	0.466	1
Cl5-BZ#105	ND		ug/kg	0.933	0.466	1
Cl5-BZ#118	ND		ug/kg	0.933	0.466	1
Cl6-BZ#128	ND		ug/kg	0.933	0.466	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-32
 Client ID: B567S04NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.54		ug/kg	0.933	0.466	1
CI6-BZ#153	2.52		ug/kg	0.933	0.466	1
CI7-BZ#170	0.715	J	ug/kg	0.933	0.466	1
CI7-BZ#180	2.23		ug/kg	0.933	0.466	1
CI7-BZ#183	0.674	J	ug/kg	0.933	0.466	1
CI7-BZ#184	ND		ug/kg	0.933	0.466	1
CI7-BZ#187	1.57		ug/kg	0.933	0.466	1
CI8-BZ#195	ND		ug/kg	0.933	0.466	1
CI9-BZ#206	ND		ug/kg	0.933	0.466	1
CI10-BZ#209	ND		ug/kg	0.933	0.466	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	61		30-150
Pyrene-d10	68		30-150
Benzo(b)fluoranthene-d12	63		30-150
DBOB	72		30-150
BZ 198	59		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-33
 Client ID: B567S04NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 17:29
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.54	4.77	1
Acenaphthylene	ND		ug/kg	9.54	4.77	1
Acenaphthene	ND		ug/kg	9.54	4.77	1
Fluorene	ND		ug/kg	9.54	4.77	1
Phenanthrene	ND		ug/kg	9.54	4.77	1
Anthracene	ND		ug/kg	9.54	4.77	1
Fluoranthene	ND		ug/kg	9.54	4.77	1
Pyrene	ND		ug/kg	9.54	4.77	1
Benz(a)anthracene	ND		ug/kg	9.54	4.77	1
Chrysene	ND		ug/kg	9.54	4.77	1
Benzo(b)fluoranthene	ND		ug/kg	9.54	4.77	1
Benzo(k)fluoranthene	ND		ug/kg	9.54	4.77	1
Benzo(a)pyrene	ND		ug/kg	9.54	4.77	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.54	4.77	1
Dibenz(a,h)anthracene	ND		ug/kg	9.54	4.77	1
Benzo(ghi)perylene	ND		ug/kg	9.54	4.77	1
Cl2-BZ#8	ND		ug/kg	0.954	0.477	1
Cl3-BZ#18	ND		ug/kg	0.954	0.477	1
Cl3-BZ#28	ND		ug/kg	0.954	0.477	1
Cl4-BZ#44	ND		ug/kg	0.954	0.477	1
Cl4-BZ#49	ND		ug/kg	0.954	0.477	1
Cl4-BZ#52	ND		ug/kg	0.954	0.477	1
Cl4-BZ#66	ND		ug/kg	0.954	0.477	1
Cl5-BZ#87	ND		ug/kg	0.954	0.477	1
Cl5-BZ#101	ND		ug/kg	0.954	0.477	1
Cl5-BZ#105	ND		ug/kg	0.954	0.477	1
Cl5-BZ#118	ND		ug/kg	0.954	0.477	1
Cl6-BZ#128	ND		ug/kg	0.954	0.477	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-33
 Client ID: B567S04NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.612	J	ug/kg	0.954	0.477	1
CI6-BZ#153	1.10		ug/kg	0.954	0.477	1
CI7-BZ#170	ND		ug/kg	0.954	0.477	1
CI7-BZ#180	0.975		ug/kg	0.954	0.477	1
CI7-BZ#183	ND		ug/kg	0.954	0.477	1
CI7-BZ#184	ND		ug/kg	0.954	0.477	1
CI7-BZ#187	ND		ug/kg	0.954	0.477	1
CI8-BZ#195	ND		ug/kg	0.954	0.477	1
CI9-BZ#206	ND		ug/kg	0.954	0.477	1
CI10-BZ#209	ND		ug/kg	0.954	0.477	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	55		30-150
Pyrene-d10	65		30-150
Benzo(b)fluoranthene-d12	60		30-150
DBOB	68		30-150
BZ 198	56		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-34
 Client ID: B567S04NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 18:04
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.67	4.84	1
Acenaphthylene	ND		ug/kg	9.67	4.84	1
Acenaphthene	ND		ug/kg	9.67	4.84	1
Fluorene	ND		ug/kg	9.67	4.84	1
Phenanthrene	ND		ug/kg	9.67	4.84	1
Anthracene	ND		ug/kg	9.67	4.84	1
Fluoranthene	ND		ug/kg	9.67	4.84	1
Pyrene	ND		ug/kg	9.67	4.84	1
Benz(a)anthracene	ND		ug/kg	9.67	4.84	1
Chrysene	ND		ug/kg	9.67	4.84	1
Benzo(b)fluoranthene	ND		ug/kg	9.67	4.84	1
Benzo(k)fluoranthene	ND		ug/kg	9.67	4.84	1
Benzo(a)pyrene	ND		ug/kg	9.67	4.84	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.67	4.84	1
Dibenz(a,h)anthracene	ND		ug/kg	9.67	4.84	1
Benzo(ghi)perylene	ND		ug/kg	9.67	4.84	1
Cl2-BZ#8	ND		ug/kg	0.967	0.484	1
Cl3-BZ#18	ND		ug/kg	0.967	0.484	1
Cl3-BZ#28	ND		ug/kg	0.967	0.484	1
Cl4-BZ#44	ND		ug/kg	0.967	0.484	1
Cl4-BZ#49	ND		ug/kg	0.967	0.484	1
Cl4-BZ#52	ND		ug/kg	0.967	0.484	1
Cl4-BZ#66	ND		ug/kg	0.967	0.484	1
Cl5-BZ#87	ND		ug/kg	0.967	0.484	1
Cl5-BZ#101	ND		ug/kg	0.967	0.484	1
Cl5-BZ#105	ND		ug/kg	0.967	0.484	1
Cl5-BZ#118	ND		ug/kg	0.967	0.484	1
Cl6-BZ#128	ND		ug/kg	0.967	0.484	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-34
 Client ID: B567S04NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	1.05		ug/kg	0.967	0.484	1
Cl6-BZ#153	1.74		ug/kg	0.967	0.484	1
Cl7-BZ#170	0.761	J	ug/kg	0.967	0.484	1
Cl7-BZ#180	0.848	J	ug/kg	0.967	0.484	1
Cl7-BZ#183	ND		ug/kg	0.967	0.484	1
Cl7-BZ#184	ND		ug/kg	0.967	0.484	1
Cl7-BZ#187	0.687	J	ug/kg	0.967	0.484	1
Cl8-BZ#195	ND		ug/kg	0.967	0.484	1
Cl9-BZ#206	ND		ug/kg	0.967	0.484	1
Cl10-BZ#209	ND		ug/kg	0.967	0.484	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-150
Pyrene-d10	81		30-150
Benzo(b)fluoranthene-d12	76		30-150
DBOB	84		30-150
BZ 198	70		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-35
 Client ID: B567S04NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 18:39
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.45	4.72	1
Acenaphthylene	ND		ug/kg	9.45	4.72	1
Acenaphthene	ND		ug/kg	9.45	4.72	1
Fluorene	ND		ug/kg	9.45	4.72	1
Phenanthrene	ND		ug/kg	9.45	4.72	1
Anthracene	ND		ug/kg	9.45	4.72	1
Fluoranthene	ND		ug/kg	9.45	4.72	1
Pyrene	ND		ug/kg	9.45	4.72	1
Benz(a)anthracene	ND		ug/kg	9.45	4.72	1
Chrysene	ND		ug/kg	9.45	4.72	1
Benzo(b)fluoranthene	ND		ug/kg	9.45	4.72	1
Benzo(k)fluoranthene	ND		ug/kg	9.45	4.72	1
Benzo(a)pyrene	ND		ug/kg	9.45	4.72	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.45	4.72	1
Dibenz(a,h)anthracene	ND		ug/kg	9.45	4.72	1
Benzo(ghi)perylene	ND		ug/kg	9.45	4.72	1
Cl2-BZ#8	ND		ug/kg	0.945	0.472	1
Cl3-BZ#18	ND		ug/kg	0.945	0.472	1
Cl3-BZ#28	ND		ug/kg	0.945	0.472	1
Cl4-BZ#44	ND		ug/kg	0.945	0.472	1
Cl4-BZ#49	ND		ug/kg	0.945	0.472	1
Cl4-BZ#52	ND		ug/kg	0.945	0.472	1
Cl4-BZ#66	ND		ug/kg	0.945	0.472	1
Cl5-BZ#87	ND		ug/kg	0.945	0.472	1
Cl5-BZ#101	ND		ug/kg	0.945	0.472	1
Cl5-BZ#105	ND		ug/kg	0.945	0.472	1
Cl5-BZ#118	ND		ug/kg	0.945	0.472	1
Cl6-BZ#128	ND		ug/kg	0.945	0.472	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-35
 Client ID: B567S04NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.75		ug/kg	0.945	0.472	1
CI6-BZ#153	3.24		ug/kg	0.945	0.472	1
CI7-BZ#170	1.36		ug/kg	0.945	0.472	1
CI7-BZ#180	3.08		ug/kg	0.945	0.472	1
CI7-BZ#183	0.858	J	ug/kg	0.945	0.472	1
CI7-BZ#184	ND		ug/kg	0.945	0.472	1
CI7-BZ#187	2.24		ug/kg	0.945	0.472	1
CI8-BZ#195	ND		ug/kg	0.945	0.472	1
CI9-BZ#206	ND		ug/kg	0.945	0.472	1
CI10-BZ#209	ND		ug/kg	0.945	0.472	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	74		30-150
Pyrene-d10	85		30-150
Benzo(b)fluoranthene-d12	80		30-150
DBOB	91		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-36
 Client ID: B567S05NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 19:13
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.56	4.78	1
Acenaphthylene	ND		ug/kg	9.56	4.78	1
Acenaphthene	ND		ug/kg	9.56	4.78	1
Fluorene	ND		ug/kg	9.56	4.78	1
Phenanthrene	ND		ug/kg	9.56	4.78	1
Anthracene	ND		ug/kg	9.56	4.78	1
Fluoranthene	5.04	J	ug/kg	9.56	4.78	1
Pyrene	7.59	J	ug/kg	9.56	4.78	1
Benz(a)anthracene	ND		ug/kg	9.56	4.78	1
Chrysene	ND		ug/kg	9.56	4.78	1
Benzo(b)fluoranthene	ND		ug/kg	9.56	4.78	1
Benzo(k)fluoranthene	ND		ug/kg	9.56	4.78	1
Benzo(a)pyrene	ND		ug/kg	9.56	4.78	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.56	4.78	1
Dibenz(a,h)anthracene	ND		ug/kg	9.56	4.78	1
Benzo(ghi)perylene	ND		ug/kg	9.56	4.78	1
Cl2-BZ#8	ND		ug/kg	0.956	0.478	1
Cl3-BZ#18	ND		ug/kg	0.956	0.478	1
Cl3-BZ#28	ND		ug/kg	0.956	0.478	1
Cl4-BZ#44	ND		ug/kg	0.956	0.478	1
Cl4-BZ#49	ND		ug/kg	0.956	0.478	1
Cl4-BZ#52	ND		ug/kg	0.956	0.478	1
Cl4-BZ#66	ND		ug/kg	0.956	0.478	1
Cl5-BZ#87	ND		ug/kg	0.956	0.478	1
Cl5-BZ#101	ND		ug/kg	0.956	0.478	1
Cl5-BZ#105	ND		ug/kg	0.956	0.478	1
Cl5-BZ#118	ND		ug/kg	0.956	0.478	1
Cl6-BZ#128	ND		ug/kg	0.956	0.478	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-36
 Client ID: B567S05NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.685	J	ug/kg	0.956	0.478	1
CI6-BZ#153	1.29		ug/kg	0.956	0.478	1
CI7-BZ#170	ND		ug/kg	0.956	0.478	1
CI7-BZ#180	0.640	J	ug/kg	0.956	0.478	1
CI7-BZ#183	ND		ug/kg	0.956	0.478	1
CI7-BZ#184	ND		ug/kg	0.956	0.478	1
CI7-BZ#187	ND		ug/kg	0.956	0.478	1
CI8-BZ#195	ND		ug/kg	0.956	0.478	1
CI9-BZ#206	ND		ug/kg	0.956	0.478	1
CI10-BZ#209	ND		ug/kg	0.956	0.478	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	96		30-150
BZ 198	78		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-37
 Client ID: B567S05NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 19:48
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.49	4.74	1
Acenaphthylene	ND		ug/kg	9.49	4.74	1
Acenaphthene	ND		ug/kg	9.49	4.74	1
Fluorene	ND		ug/kg	9.49	4.74	1
Phenanthrene	ND		ug/kg	9.49	4.74	1
Anthracene	ND		ug/kg	9.49	4.74	1
Fluoranthene	6.85	J	ug/kg	9.49	4.74	1
Pyrene	9.66		ug/kg	9.49	4.74	1
Benz(a)anthracene	ND		ug/kg	9.49	4.74	1
Chrysene	ND		ug/kg	9.49	4.74	1
Benzo(b)fluoranthene	ND		ug/kg	9.49	4.74	1
Benzo(k)fluoranthene	ND		ug/kg	9.49	4.74	1
Benzo(a)pyrene	ND		ug/kg	9.49	4.74	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.49	4.74	1
Dibenz(a,h)anthracene	ND		ug/kg	9.49	4.74	1
Benzo(ghi)perylene	ND		ug/kg	9.49	4.74	1
Cl2-BZ#8	ND		ug/kg	0.949	0.474	1
Cl3-BZ#18	ND		ug/kg	0.949	0.474	1
Cl3-BZ#28	ND		ug/kg	0.949	0.474	1
Cl4-BZ#44	ND		ug/kg	0.949	0.474	1
Cl4-BZ#49	ND		ug/kg	0.949	0.474	1
Cl4-BZ#52	ND		ug/kg	0.949	0.474	1
Cl4-BZ#66	ND		ug/kg	0.949	0.474	1
Cl5-BZ#87	ND		ug/kg	0.949	0.474	1
Cl5-BZ#101	ND		ug/kg	0.949	0.474	1
Cl5-BZ#105	ND		ug/kg	0.949	0.474	1
Cl5-BZ#118	ND		ug/kg	0.949	0.474	1
Cl6-BZ#128	ND		ug/kg	0.949	0.474	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-37
 Client ID: B567S05NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	0.863	J	ug/kg	0.949	0.474	1
CI6-BZ#153	1.33		ug/kg	0.949	0.474	1
CI7-BZ#170	ND		ug/kg	0.949	0.474	1
CI7-BZ#180	0.638	J	ug/kg	0.949	0.474	1
CI7-BZ#183	ND		ug/kg	0.949	0.474	1
CI7-BZ#184	ND		ug/kg	0.949	0.474	1
CI7-BZ#187	0.564	J	ug/kg	0.949	0.474	1
CI8-BZ#195	ND		ug/kg	0.949	0.474	1
CI9-BZ#206	ND		ug/kg	0.949	0.474	1
CI10-BZ#209	ND		ug/kg	0.949	0.474	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	86		30-150
DBOB	98		30-150
BZ 198	76		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-38
 Client ID: B567S05NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 20:22
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.02	4.51	1
Acenaphthylene	ND		ug/kg	9.02	4.51	1
Acenaphthene	ND		ug/kg	9.02	4.51	1
Fluorene	ND		ug/kg	9.02	4.51	1
Phenanthrene	ND		ug/kg	9.02	4.51	1
Anthracene	ND		ug/kg	9.02	4.51	1
Fluoranthene	4.61	J	ug/kg	9.02	4.51	1
Pyrene	6.57	J	ug/kg	9.02	4.51	1
Benz(a)anthracene	ND		ug/kg	9.02	4.51	1
Chrysene	ND		ug/kg	9.02	4.51	1
Benzo(b)fluoranthene	ND		ug/kg	9.02	4.51	1
Benzo(k)fluoranthene	ND		ug/kg	9.02	4.51	1
Benzo(a)pyrene	ND		ug/kg	9.02	4.51	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.02	4.51	1
Dibenz(a,h)anthracene	ND		ug/kg	9.02	4.51	1
Benzo(ghi)perylene	ND		ug/kg	9.02	4.51	1
Cl2-BZ#8	ND		ug/kg	0.902	0.451	1
Cl3-BZ#18	3.47		ug/kg	0.902	0.451	1
Cl3-BZ#28	ND		ug/kg	0.902	0.451	1
Cl4-BZ#44	ND		ug/kg	0.902	0.451	1
Cl4-BZ#49	ND		ug/kg	0.902	0.451	1
Cl4-BZ#52	ND		ug/kg	0.902	0.451	1
Cl4-BZ#66	ND		ug/kg	0.902	0.451	1
Cl5-BZ#87	ND		ug/kg	0.902	0.451	1
Cl5-BZ#101	ND		ug/kg	0.902	0.451	1
Cl5-BZ#105	ND		ug/kg	0.902	0.451	1
Cl5-BZ#118	ND		ug/kg	0.902	0.451	1
Cl6-BZ#128	ND		ug/kg	0.902	0.451	1



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-38
Client ID: B567S05NVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.25		ug/kg	0.902	0.451	1
CI6-BZ#153	1.98		ug/kg	0.902	0.451	1
CI7-BZ#170	ND		ug/kg	0.902	0.451	1
CI7-BZ#180	1.37		ug/kg	0.902	0.451	1
CI7-BZ#183	0.549	J	ug/kg	0.902	0.451	1
CI7-BZ#184	ND		ug/kg	0.902	0.451	1
CI7-BZ#187	1.28		ug/kg	0.902	0.451	1
CI8-BZ#195	ND		ug/kg	0.902	0.451	1
CI9-BZ#206	ND		ug/kg	0.902	0.451	1
CI10-BZ#209	ND		ug/kg	0.902	0.451	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	89		30-150
Benzo(b)fluoranthene-d12	83		30-150
DBOB	94		30-150
BZ 198	77		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-39
 Client ID: B567S05NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 20:56
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.21	4.60	1
Acenaphthylene	ND		ug/kg	9.21	4.60	1
Acenaphthene	ND		ug/kg	9.21	4.60	1
Fluorene	ND		ug/kg	9.21	4.60	1
Phenanthrene	ND		ug/kg	9.21	4.60	1
Anthracene	ND		ug/kg	9.21	4.60	1
Fluoranthene	7.95	J	ug/kg	9.21	4.60	1
Pyrene	10.3		ug/kg	9.21	4.60	1
Benz(a)anthracene	ND		ug/kg	9.21	4.60	1
Chrysene	ND		ug/kg	9.21	4.60	1
Benzo(b)fluoranthene	ND		ug/kg	9.21	4.60	1
Benzo(k)fluoranthene	ND		ug/kg	9.21	4.60	1
Benzo(a)pyrene	ND		ug/kg	9.21	4.60	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.21	4.60	1
Dibenz(a,h)anthracene	ND		ug/kg	9.21	4.60	1
Benzo(ghi)perylene	ND		ug/kg	9.21	4.60	1
Cl2-BZ#8	ND		ug/kg	0.921	0.460	1
Cl3-BZ#18	ND		ug/kg	0.921	0.460	1
Cl3-BZ#28	ND		ug/kg	0.921	0.460	1
Cl4-BZ#44	ND		ug/kg	0.921	0.460	1
Cl4-BZ#49	ND		ug/kg	0.921	0.460	1
Cl4-BZ#52	ND		ug/kg	0.921	0.460	1
Cl4-BZ#66	ND		ug/kg	0.921	0.460	1
Cl5-BZ#87	ND		ug/kg	0.921	0.460	1
Cl5-BZ#101	ND		ug/kg	0.921	0.460	1
Cl5-BZ#105	ND		ug/kg	0.921	0.460	1
Cl5-BZ#118	ND		ug/kg	0.921	0.460	1
Cl6-BZ#128	ND		ug/kg	0.921	0.460	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-39
 Client ID: B567S05NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl6-BZ#138	1.34		ug/kg	0.921	0.460	1
Cl6-BZ#153	2.03		ug/kg	0.921	0.460	1
Cl7-BZ#170	ND		ug/kg	0.921	0.460	1
Cl7-BZ#180	1.57		ug/kg	0.921	0.460	1
Cl7-BZ#183	0.513	J	ug/kg	0.921	0.460	1
Cl7-BZ#184	ND		ug/kg	0.921	0.460	1
Cl7-BZ#187	1.07		ug/kg	0.921	0.460	1
Cl8-BZ#195	ND		ug/kg	0.921	0.460	1
Cl9-BZ#206	ND		ug/kg	0.921	0.460	1
Cl10-BZ#209	ND		ug/kg	0.921	0.460	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-150
Pyrene-d10	92		30-150
Benzo(b)fluoranthene-d12	84		30-150
DBOB	106		30-150
BZ 198	83		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-40
 Client ID: B567S05NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/24/19 21:29
 Analyst: GP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:12
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	9.33	4.66	1
Acenaphthylene	ND		ug/kg	9.33	4.66	1
Acenaphthene	ND		ug/kg	9.33	4.66	1
Fluorene	ND		ug/kg	9.33	4.66	1
Phenanthrene	ND		ug/kg	9.33	4.66	1
Anthracene	ND		ug/kg	9.33	4.66	1
Fluoranthene	5.74	J	ug/kg	9.33	4.66	1
Pyrene	7.52	J	ug/kg	9.33	4.66	1
Benz(a)anthracene	ND		ug/kg	9.33	4.66	1
Chrysene	ND		ug/kg	9.33	4.66	1
Benzo(b)fluoranthene	ND		ug/kg	9.33	4.66	1
Benzo(k)fluoranthene	ND		ug/kg	9.33	4.66	1
Benzo(a)pyrene	ND		ug/kg	9.33	4.66	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	9.33	4.66	1
Dibenz(a,h)anthracene	ND		ug/kg	9.33	4.66	1
Benzo(ghi)perylene	ND		ug/kg	9.33	4.66	1
Cl2-BZ#8	ND		ug/kg	0.933	0.466	1
Cl3-BZ#18	ND		ug/kg	0.933	0.466	1
Cl3-BZ#28	ND		ug/kg	0.933	0.466	1
Cl4-BZ#44	ND		ug/kg	0.933	0.466	1
Cl4-BZ#49	ND		ug/kg	0.933	0.466	1
Cl4-BZ#52	ND		ug/kg	0.933	0.466	1
Cl4-BZ#66	ND		ug/kg	0.933	0.466	1
Cl5-BZ#87	ND		ug/kg	0.933	0.466	1
Cl5-BZ#101	ND		ug/kg	0.933	0.466	1
Cl5-BZ#105	ND		ug/kg	0.933	0.466	1
Cl5-BZ#118	ND		ug/kg	0.933	0.466	1
Cl6-BZ#128	ND		ug/kg	0.933	0.466	1

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-40
 Client ID: B567S05NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
CI6-BZ#138	1.54		ug/kg	0.933	0.466	1
CI6-BZ#153	2.69		ug/kg	0.933	0.466	1
CI7-BZ#170	ND		ug/kg	0.933	0.466	1
CI7-BZ#180	1.92		ug/kg	0.933	0.466	1
CI7-BZ#183	0.527	J	ug/kg	0.933	0.466	1
CI7-BZ#184	ND		ug/kg	0.933	0.466	1
CI7-BZ#187	1.08		ug/kg	0.933	0.466	1
CI8-BZ#195	ND		ug/kg	0.933	0.466	1
CI9-BZ#206	ND		ug/kg	0.933	0.466	1
CI10-BZ#209	ND		ug/kg	0.933	0.466	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	81		30-150
Pyrene-d10	99		30-150
Benzo(b)fluoranthene-d12	90		30-150
DBOB	101		30-150
BZ 198	84		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/23/19 17:51
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 09:33
Cleanup Method: EPA 3611B
Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194727-1					
Naphthalene	ND		ug/kg	10.0	5.00
Acenaphthylene	ND		ug/kg	10.0	5.00
Acenaphthene	ND		ug/kg	10.0	5.00
Fluorene	ND		ug/kg	10.0	5.00
Phenanthrene	ND		ug/kg	10.0	5.00
Anthracene	ND		ug/kg	10.0	5.00
Fluoranthene	ND		ug/kg	10.0	5.00
Pyrene	ND		ug/kg	10.0	5.00
Benz(a)anthracene	ND		ug/kg	10.0	5.00
Chrysene	ND		ug/kg	10.0	5.00
Benzo(b)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(k)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(a)pyrene	ND		ug/kg	10.0	5.00
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	10.0	5.00
Dibenz(a,h)anthracene	ND		ug/kg	10.0	5.00
Benzo(ghi)perylene	ND		ug/kg	10.0	5.00
C12-BZ#8	ND		ug/kg	1.00	0.500
C13-BZ#18	ND		ug/kg	1.00	0.500
C13-BZ#28	ND		ug/kg	1.00	0.500
C14-BZ#44	ND		ug/kg	1.00	0.500
C14-BZ#49	ND		ug/kg	1.00	0.500
C14-BZ#52	ND		ug/kg	1.00	0.500
C14-BZ#66	ND		ug/kg	1.00	0.500
C15-BZ#87	ND		ug/kg	1.00	0.500
C15-BZ#101	ND		ug/kg	1.00	0.500
C15-BZ#105	ND		ug/kg	1.00	0.500
C15-BZ#118	ND		ug/kg	1.00	0.500
C16-BZ#128	ND		ug/kg	1.00	0.500
C16-BZ#138	ND		ug/kg	1.00	0.500



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/23/19 17:51
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 09:33
Cleanup Method: EPA 3611B
Cleanup Date: 01/08/19

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194727-1					
Cl6-BZ#153	ND		ug/kg	1.00	0.500
Cl7-BZ#170	ND		ug/kg	1.00	0.500
Cl7-BZ#180	ND		ug/kg	1.00	0.500
Cl7-BZ#183	ND		ug/kg	1.00	0.500
Cl7-BZ#184	ND		ug/kg	1.00	0.500
Cl7-BZ#187	ND		ug/kg	1.00	0.500
Cl8-BZ#195	ND		ug/kg	1.00	0.500
Cl9-BZ#206	ND		ug/kg	1.00	0.500
Cl10-BZ#209	ND		ug/kg	1.00	0.500

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	45		30-150
Pyrene-d10	60		30-150
Benzo(b)fluoranthene-d12	57		30-150
DBOB	53		30-150
BZ 198	49		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 01/23/19 17:17
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 09:34
Cleanup Method: EPA 3611B
Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 21-40 Batch: WG1194731-1					
Naphthalene	ND		ug/kg	10.0	5.00
Acenaphthylene	ND		ug/kg	10.0	5.00
Acenaphthene	ND		ug/kg	10.0	5.00
Fluorene	ND		ug/kg	10.0	5.00
Phenanthrene	ND		ug/kg	10.0	5.00
Anthracene	ND		ug/kg	10.0	5.00
Fluoranthene	ND		ug/kg	10.0	5.00
Pyrene	ND		ug/kg	10.0	5.00
Benz(a)anthracene	ND		ug/kg	10.0	5.00
Chrysene	ND		ug/kg	10.0	5.00
Benzo(b)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(k)fluoranthene	ND		ug/kg	10.0	5.00
Benzo(a)pyrene	ND		ug/kg	10.0	5.00
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	10.0	5.00
Dibenz(a,h)anthracene	ND		ug/kg	10.0	5.00
Benzo(ghi)perylene	ND		ug/kg	10.0	5.00
C12-BZ#8	ND		ug/kg	1.00	0.500
C13-BZ#18	ND		ug/kg	1.00	0.500
C13-BZ#28	ND		ug/kg	1.00	0.500
C14-BZ#44	ND		ug/kg	1.00	0.500
C14-BZ#49	ND		ug/kg	1.00	0.500
C14-BZ#52	ND		ug/kg	1.00	0.500
C14-BZ#66	ND		ug/kg	1.00	0.500
C15-BZ#87	ND		ug/kg	1.00	0.500
C15-BZ#101	ND		ug/kg	1.00	0.500
C15-BZ#105	ND		ug/kg	1.00	0.500
C15-BZ#118	ND		ug/kg	1.00	0.500
C16-BZ#128	ND		ug/kg	1.00	0.500
C16-BZ#138	ND		ug/kg	1.00	0.500

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

**Method Blank Analysis
 Batch Quality Control**

Analytical Method: 105,8270D-SIM/680(M)
 Analytical Date: 01/23/19 17:17
 Analyst: GP

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3611B
 Cleanup Date: 01/09/18

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 21-40 Batch: WG1194731-1					
Cl6-BZ#153	ND		ug/kg	1.00	0.500
Cl7-BZ#170	ND		ug/kg	1.00	0.500
Cl7-BZ#180	ND		ug/kg	1.00	0.500
Cl7-BZ#183	ND		ug/kg	1.00	0.500
Cl7-BZ#184	ND		ug/kg	1.00	0.500
Cl7-BZ#187	ND		ug/kg	1.00	0.500
Cl8-BZ#195	ND		ug/kg	1.00	0.500
Cl9-BZ#206	ND		ug/kg	1.00	0.500
Cl10-BZ#209	ND		ug/kg	1.00	0.500

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	61		30-150
Pyrene-d10	71		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	79		30-150
BZ 198	63		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194727-2 WG1194727-3								
Naphthalene	69		70		50-120	1		30
Acenaphthylene	71		73		50-120	3		30
Acenaphthene	70		72		50-120	3		30
Fluorene	72		75		50-120	4		30
Phenanthrene	69		74		50-120	7		30
Anthracene	75		80		50-120	6		30
Fluoranthene	68		81		50-120	17		30
Pyrene	68		77		50-120	12		30
Benz(a)anthracene	75		89		50-120	17		30
Chrysene	74		86		50-120	15		30
Benzo(b)fluoranthene	63		80		50-120	24		30
Benzo(k)fluoranthene	73		84		50-120	14		30
Benzo(a)pyrene	71		85		50-120	18		30
Indeno(1,2,3-cd)Pyrene	69		80		50-120	15		30
Dibenz(a,h)anthracene	73		86		50-120	16		30
Benzo(ghi)perylene	71		84		50-120	17		30
Cl2-BZ#8	59		59		50-120	0		30
Cl3-BZ#18	55		57		50-120	4		30
Cl3-BZ#28	57		60		50-120	5		30
Cl4-BZ#44	60		64		50-120	6		30
Cl4-BZ#49	59		64		50-120	8		30
Cl4-BZ#52	55		58		50-120	5		30
Cl4-BZ#66	60		65		50-120	8		30

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194727-2 WG1194727-3								
CI5-BZ#87	61		67		50-120	9		30
CI5-BZ#101	62		68		50-120	9		30
CI5-BZ#105	64		72		50-120	12		30
CI5-BZ#118	58		64		50-120	10		30
CI6-BZ#128	63		70		50-120	11		30
CI6-BZ#138	63		71		50-120	12		30
CI6-BZ#153	63		71		50-120	12		30
CI7-BZ#170	67		75		50-120	11		30
CI7-BZ#180	62		69		50-120	11		30
CI7-BZ#183	60		68		50-120	13		30
CI7-BZ#184	61		69		50-120	12		30
CI7-BZ#187	60		68		50-120	13		30
CI8-BZ#195	66		74		50-120	11		30
CI9-BZ#206	62		70		50-120	12		30
CI10-BZ#209	68		76		50-120	11		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	74		75		30-150
Pyrene-d10	77		86		30-150
Benzo(b)fluoranthene-d12	71		85		30-150
DBOB	81		89		30-150
BZ 198	64		71		30-150



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194731-2 WG1194731-3								
Naphthalene	72		70		50-120	3		30
Acenaphthylene	76		76		50-120	0		30
Acenaphthene	74		75		50-120	1		30
Fluorene	78		77		50-120	1		30
Phenanthrene	77		77		50-120	0		30
Anthracene	87		86		50-120	1		30
Fluoranthene	78		78		50-120	0		30
Pyrene	81		81		50-120	0		30
Benz(a)anthracene	92		92		50-120	0		30
Chrysene	90		88		50-120	2		30
Benzo(b)fluoranthene	87		79		50-120	10		30
Benzo(k)fluoranthene	81		85		50-120	5		30
Benzo(a)pyrene	87		87		50-120	0		30
Indeno(1,2,3-cd)Pyrene	88		93		50-120	6		30
Dibenz(a,h)anthracene	89		97		50-120	9		30
Benzo(ghi)perylene	87		89		50-120	2		30
Cl2-BZ#8	64		68		50-120	6		30
Cl3-BZ#18	63		65		50-120	3		30
Cl3-BZ#28	68		69		50-120	1		30
Cl4-BZ#44	73		74		50-120	1		30
Cl4-BZ#49	72		73		50-120	1		30
Cl4-BZ#52	66		69		50-120	4		30
Cl4-BZ#66	72		74		50-120	3		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194731-2 WG1194731-3								
CI5-BZ#87	74		76		50-120	3		30
CI5-BZ#101	75		77		50-120	3		30
CI5-BZ#105	79		80		50-120	1		30
CI5-BZ#118	71		71		50-120	0		30
CI6-BZ#128	78		80		50-120	3		30
CI6-BZ#138	78		79		50-120	1		30
CI6-BZ#153	78		78		50-120	0		30
CI7-BZ#170	84		83		50-120	1		30
CI7-BZ#180	77		75		50-120	3		30
CI7-BZ#183	75		75		50-120	0		30
CI7-BZ#184	76		76		50-120	0		30
CI7-BZ#187	75		75		50-120	0		30
CI8-BZ#195	82		79		50-120	4		30
CI9-BZ#206	77		76		50-120	1		30
CI10-BZ#209	83		86		50-120	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	77		75		30-150
Pyrene-d10	89		88		30-150
Benzo(b)fluoranthene-d12	86		83		30-150
DBOB	95		87		30-150
BZ 198	77		76		30-150

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194727-4 WG1194727-5 QC Sample: L1853059-01 Client ID: B567PRENVA												
Naphthalene	ND	489	340	70		364	73		50-120	7		30
Acenaphthylene	ND	489	346	71		362	73		50-120	5		30
Acenaphthene	ND	489	336	69		355	72		50-120	5		30
Fluorene	ND	489	347	71		367	74		50-120	6		30
Phenanthrene	5.45J	489	384	79		383	77		50-120	0		30
Anthracene	ND	489	335	69		357	72		50-120	6		30
Fluoranthene	5.49J	489	373	76		382	77		50-120	2		30
Pyrene	4.94J	489	337	69		343	69		50-120	2		30
Benz(a)anthracene	ND	489	429	88		449	91		50-120	5		30
Chrysene	ND	489	318	65		312	63		50-120	2		30
Benzo(b)fluoranthene	ND	489	380	78		407	82		50-120	7		30
Benzo(k)fluoranthene	ND	489	304	62		283	57		50-120	7		30
Benzo(a)pyrene	ND	489	349	71		343	69		50-120	2		30
Indeno(1,2,3-cd)Pyrene	ND	489	459	94		463	93		50-120	1		30
Dibenz(a,h)anthracene	ND	489	383	78		390	79		50-120	2		30
Benzo(ghi)perylene	ND	489	366	75		365	74		50-120	0		30
Cl2-BZ#8	ND	97.8	55.9	57		60.0	61		50-120	7		30
Cl3-BZ#18	ND	97.8	109	111		191	193	Q	50-120	55	Q	30
Cl3-BZ#28	ND	97.8	55.8	57		59.3	60		50-120	6		30
Cl4-BZ#44	ND	97.8	58.5	60		61.4	62		50-120	5		30
Cl4-BZ#49	ND	97.8	48.3	49	Q	49.2	50		50-120	2		30
Cl4-BZ#52	ND	97.8	60.5	62		66.0	67		50-120	9		30
Cl4-BZ#66	ND	97.8	57.4	59		60.9	61		50-120	6		30

Matrix Spike Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194727-4 WG1194727-5 QC Sample: L1853059-01 Client ID: B567PRENVA												
CI5-BZ#87	ND	97.8	59.4	61		61.7	62		50-120	4		30
CI5-BZ#101	0.496J	97.8	60.7	62		63.4	64		50-120	4		30
CI5-BZ#105	ND	97.8	56.8	58		60.5	61		50-120	6		30
CI5-BZ#118	ND	97.8	55.7	57		58.4	59		50-120	5		30
CI6-BZ#128	ND	97.8	62.3	64		63.7	64		50-120	2		30
CI6-BZ#138	1.80	97.8	63.0	63		65.6	64		50-120	4		30
CI6-BZ#153	2.56	97.8	65.0	64		67.4	65		50-120	4		30
CI7-BZ#170	0.882J	97.8	65.9	67		67.8	68		50-120	3		30
CI7-BZ#180	2.51	97.8	63.2	62		65.8	64		50-120	4		30
CI7-BZ#183	0.832J	97.8	51.1	52		51.5	52		50-120	1		30
CI7-BZ#184	ND	97.8	58.8	60		60.7	61		50-120	3		30
CI7-BZ#187	2.09	97.8	67.6	67		72.0	71		50-120	6		30
CI8-BZ#195	ND	97.8	61.7	63		63.6	64		50-120	3		30
CI9-BZ#206	ND	97.8	57.4	59		60.0	61		50-120	4		30
CI10-BZ#209	ND	97.8	62.9	64		66.4	67		50-120	5		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		76		30-150
BZ 198	67		70		30-150
Benzo(b)fluoranthene-d12	72		72		30-150
DBOB	78		84		30-150
Pyrene-d10	76		76		30-150



Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab ID: B567S02NVA Associated sample(s): 21-40 QC Batch ID: WG1194731-4 WG1194731-5 QC Sample: L1853059-21 Client												
Naphthalene	ND	496	347	70		298	67		50-120	15		30
Acenaphthylene	ND	496	363	73		316	71		50-120	14		30
Acenaphthene	ND	496	364	73		316	71		50-120	14		30
Fluorene	ND	496	380	77		329	74		50-120	14		30
Phenanthrene	ND	496	386	78		328	74		50-120	16		30
Anthracene	ND	496	401	81		340	76		50-120	16		30
Fluoranthene	10.0	496	414	81		359	79		50-120	14		30
Pyrene	7.18J	496	367	74		321	72		50-120	13		30
Benz(a)anthracene	ND	496	440	89		390	88		50-120	12		30
Chrysene	ND	496	370	75		307	69		50-120	19		30
Benzo(b)fluoranthene	ND	496	411	83		328	74		50-120	22		30
Benzo(k)fluoranthene	ND	496	349	70		316	71		50-120	10		30
Benzo(a)pyrene	ND	496	382	77		320	72		50-120	18		30
Indeno(1,2,3-cd)Pyrene	ND	496	434	88		352	79		50-120	21		30
Dibenz(a,h)anthracene	ND	496	402	81		343	77		50-120	16		30
Benzo(ghi)perylene	ND	496	388	78		331	74		50-120	16		30
Cl2-BZ#8	ND	99.2	62.7	63		55.0	62		50-120	13		30
Cl3-BZ#18	ND	99.2	74.1	75		65.4	74		50-120	12		30
Cl3-BZ#28	ND	99.2	64.2	65		57.0	64		50-120	12		30
Cl4-BZ#44	ND	99.2	65.6	66		59.8	67		50-120	9		30
Cl4-BZ#49	ND	99.2	59.3	60		52.7	59		50-120	12		30
Cl4-BZ#52	0.594J	99.2	63.6	64		58.8	66		50-120	8		30
Cl4-BZ#66	ND	99.2	63.5	64		56.7	64		50-120	11		30

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab ID: B567S02NVA Associated sample(s): 21-40 QC Batch ID: WG1194731-4 WG1194731-5 QC Sample: L1853059-21 Client												
CI5-BZ#87	ND	99.2	67.8	68		60.1	68		50-120	12		30
CI5-BZ#101	0.633J	99.2	69.7	70		61.8	70		50-120	12		30
CI5-BZ#105	0.585J	99.2	67.7	68		57.8	65		50-120	16		30
CI5-BZ#118	ND	99.2	64.2	65		55.8	63		50-120	14		30
CI6-BZ#128	ND	99.2	70.5	71		60.9	69		50-120	15		30
CI6-BZ#138	3.44	99.2	74.5	72		64.2	68		50-120	15		30
CI6-BZ#153	5.83	99.2	77.3	72		68.1	70		50-120	13		30
CI7-BZ#170	2.28	99.2	79.4	78		66.0	72		50-120	18		30
CI7-BZ#180	5.56	99.2	75.0	70		63.8	66		50-120	16		30
CI7-BZ#183	1.70	99.2	61.6	60		53.7	58		50-120	14		30
CI7-BZ#184	ND	99.2	67.5	68		59.0	66		50-120	13		30
CI7-BZ#187	3.81	99.2	76.9	74		65.5	69		50-120	16		30
CI8-BZ#195	0.693J	99.2	74.0	75		61.7	69		50-120	18		30
CI9-BZ#206	ND	99.2	68.0	69		56.2	63		50-120	19		30
CI10-BZ#209	ND	99.2	74.2	75		62.8	71		50-120	17		30

<i>Surrogate</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>
2-Methylnaphthalene-d10	73		71		30-150
BZ 198	77		71		30-150
Benzo(b)fluoranthene-d12	78		74		30-150
DBOB	86		84		30-150
Pyrene-d10	80		78		30-150

Lab Duplicate Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194727-6 QC Sample: L1853059-02 Client ID: B567PRENVB						
Naphthalene	ND	ND	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Acenaphthene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Fluoranthene	ND	ND	ug/kg	NC		30
Pyrene	ND	ND	ug/kg	NC		30
Benz(a)anthracene	ND	ND	ug/kg	NC		30
Chrysene	ND	ND	ug/kg	NC		30
Benzo(b)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(a)pyrene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/kg	NC		30
Dibenz(a,h)anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Cl2-BZ#8	ND	ND	ug/kg	NC		30
Cl3-BZ#18	ND	ND	ug/kg	NC		30
Cl3-BZ#28	ND	ND	ug/kg	NC		30
Cl4-BZ#44	ND	ND	ug/kg	NC		30
Cl4-BZ#49	ND	ND	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194727-6 QC Sample: L1853059-02 Client ID: B567PRENVB						
CI4-BZ#52	ND	ND	ug/kg	NC		30
CI4-BZ#66	ND	ND	ug/kg	NC		30
CI5-BZ#87	ND	ND	ug/kg	NC		30
CI5-BZ#101	ND	0.574J	ug/kg	NC		30
CI5-BZ#105	ND	ND	ug/kg	NC		30
CI5-BZ#118	ND	ND	ug/kg	NC		30
CI6-BZ#128	ND	ND	ug/kg	NC		30
CI6-BZ#138	2.28	2.64	ug/kg	15		30
CI6-BZ#153	2.58	3.56	ug/kg	32	Q	30
CI7-BZ#170	1.01	1.18	ug/kg	16		30
CI7-BZ#180	2.70	3.83	ug/kg	35	Q	30
CI7-BZ#183	0.880J	1.03	ug/kg	NC		30
CI7-BZ#184	ND	ND	ug/kg	NC		30
CI7-BZ#187	1.79	2.67	ug/kg	39	Q	30
CI8-BZ#195	ND	ND	ug/kg	NC		30
CI9-BZ#206	ND	ND	ug/kg	NC		30
CI10-BZ#209	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	72		82		30-150



Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853059

Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194727-6 QC Sample: L1853059-02 Client ID: B567PRENVB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Pyrene-d10	76		85		30-150
Benzo(b)fluoranthene-d12	69		79		30-150
DBOB	84		97		30-150
BZ 198	65		70		30-150



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853059

Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194731-6 QC Sample: L1853059-22 Client ID: B567S02NVB						
Naphthalene	ND	ND	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Acenaphthene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Fluoranthene	8.77J	8.17J	ug/kg	NC		30
Pyrene	6.21J	5.98J	ug/kg	NC		30
Benz(a)anthracene	ND	ND	ug/kg	NC		30
Chrysene	ND	ND	ug/kg	NC		30
Benzo(b)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(a)pyrene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/kg	NC		30
Dibenz(a,h)anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Cl2-BZ#8	ND	ND	ug/kg	NC		30
Cl3-BZ#18	ND	ND	ug/kg	NC		30
Cl3-BZ#28	ND	ND	ug/kg	NC		30
Cl4-BZ#44	ND	ND	ug/kg	NC		30
Cl4-BZ#49	ND	ND	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194731-6 QC Sample: L1853059-22 Client ID: B567S02NVB						
CI4-BZ#52	ND	0.464J	ug/kg	NC		30
CI4-BZ#66	ND	ND	ug/kg	NC		30
CI5-BZ#87	ND	ND	ug/kg	NC		30
CI5-BZ#101	0.566J	0.591J	ug/kg	NC		30
CI5-BZ#105	ND	ND	ug/kg	NC		30
CI5-BZ#118	ND	ND	ug/kg	NC		30
CI6-BZ#128	ND	ND	ug/kg	NC		30
CI6-BZ#138	1.88	1.86	ug/kg	1		30
CI6-BZ#153	3.15	3.08	ug/kg	2		30
CI7-BZ#170	1.13	1.23	ug/kg	8		30
CI7-BZ#180	2.76	3.10	ug/kg	12		30
CI7-BZ#183	0.758J	1.03	ug/kg	NC		30
CI7-BZ#184	ND	ND	ug/kg	NC		30
CI7-BZ#187	2.04	2.30	ug/kg	12		30
CI8-BZ#195	ND	ND	ug/kg	NC		30
CI9-BZ#206	ND	ND	ug/kg	NC		30
CI10-BZ#209	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	62		65		30-150



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194731-6 QC Sample: L1853059-22 Client ID: B567S02NVB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Pyrene-d10	72		76		30-150
Benzo(b)fluoranthene-d12	74		70		30-150
DBOB	78		82		30-150
BZ 198	63		66		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194727-7

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	65		40-140
Fluoranthene	68		40-140
Pyrene	70		40-140
Chrysene	60		40-140
Cl3-BZ#28	40		40-140
Cl4-BZ#44	76		40-140
Cl4-BZ#49	68		40-140
Cl4-BZ#52	71		40-140
Cl4-BZ#66	81		40-140
Cl5-BZ#87	49		40-140
Cl5-BZ#101	43		40-140
Cl5-BZ#105	78		40-140
Cl5-BZ#118	73		40-140
Cl6-BZ#138	86		40-140
Cl6-BZ#153	54		40-140
Cl7-BZ#187	44		40-140
2-Methylnaphthalene-d10 (Surrogate)	67		75-125
Pyrene-d10 (Surrogate)	71		75-125
Benzo(b)fluoranthene-d12 (Surrogate)	66		75-125
DBOB (Surrogate)	84		75-125
BZ 198 (Surrogate)	60		75-125

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194731-7

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	62		40-140
Fluoranthene	65		40-140
Pyrene	67		40-140
Chrysene	58		40-140
Cl3-BZ#28	35	Q	40-140
Cl4-BZ#44	79		40-140
Cl4-BZ#49	59		40-140
Cl4-BZ#52	67		40-140
Cl4-BZ#66	79		40-140
Cl5-BZ#87	46		40-140
Cl5-BZ#101	42		40-140
Cl5-BZ#105	69		40-140
Cl5-BZ#118	57		40-140
Cl6-BZ#138	83		40-140
Cl6-BZ#153	51		40-140
Cl7-BZ#187	40		40-140
2-Methylnaphthalene-d10 (Surrogate)	63		75-125
Pyrene-d10 (Surrogate)	72		75-125
Benzo(b)fluoranthene-d12 (Surrogate)	71		75-125
DBOB (Surrogate)	82		75-125
BZ 198 (Surrogate)	60		75-125

PESTICIDES

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-01
 Client ID: B567PRENVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 19:38
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.949	0.949	1	A
gamma-BHC	ND		ug/kg	0.474	0.474	1	A
Heptachlor	ND		ug/kg	0.474	0.474	1	A
Aldrin	ND		ug/kg	0.474	0.474	1	A
Heptachlor epoxide	ND		ug/kg	0.949	0.949	1	B
Oxychlorane	ND		ug/kg	0.949	0.949	1	B
trans-Chlordane	ND		ug/kg	0.474	0.474	1	A
Endosulfan I	ND		ug/kg	0.474	0.474	1	A
cis-Chlordane	ND		ug/kg	0.474	0.474	1	A
trans-Nonachlor	ND		ug/kg	0.474	0.474	1	B
4,4'-DDE	ND		ug/kg	0.474	0.474	1	A
Dieldrin	ND		ug/kg	0.474	0.474	1	A
Endrin	ND		ug/kg	0.474	0.474	1	A
Endosulfan II	ND		ug/kg	0.474	0.474	1	A
4,4'-DDD	ND		ug/kg	0.474	0.474	1	A
cis-Nonachlor	ND		ug/kg	0.474	0.474	1	A
4,4'-DDT	ND		ug/kg	0.474	0.474	1	A
Methoxychlor	ND		ug/kg	1.90	1.90	1	A
Toxaphene	ND		ug/kg	23.8	23.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	73		30-150	B
BZ 198	75		30-150	B
DBOB	119		30-150	A
BZ 198	71		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-02
 Client ID: B567PRENVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 21:20
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.942	0.942	1	A
gamma-BHC	ND		ug/kg	0.471	0.471	1	A
Heptachlor	ND		ug/kg	0.471	0.471	1	A
Aldrin	ND		ug/kg	0.471	0.471	1	A
Heptachlor epoxide	ND		ug/kg	0.942	0.942	1	B
Oxychlordane	ND		ug/kg	0.942	0.942	1	B
trans-Chlordane	ND		ug/kg	0.471	0.471	1	A
Endosulfan I	ND		ug/kg	0.471	0.471	1	A
cis-Chlordane	ND		ug/kg	0.471	0.471	1	A
trans-Nonachlor	ND		ug/kg	0.471	0.471	1	B
4,4'-DDE	ND		ug/kg	0.471	0.471	1	A
Dieldrin	ND		ug/kg	0.471	0.471	1	A
Endrin	ND		ug/kg	0.471	0.471	1	A
Endosulfan II	ND		ug/kg	0.471	0.471	1	A
4,4'-DDD	ND		ug/kg	0.471	0.471	1	A
cis-Nonachlor	ND		ug/kg	0.471	0.471	1	A
4,4'-DDT	ND		ug/kg	0.471	0.471	1	A
Methoxychlor	ND		ug/kg	1.88	1.88	1	A
Toxaphene	ND		ug/kg	23.6	23.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	74		30-150	B
BZ 198	84		30-150	B
DBOB	120		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-03
 Client ID: B567PRENVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 22:28
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.928	0.928	1	A
gamma-BHC	ND		ug/kg	0.464	0.464	1	A
Heptachlor	ND		ug/kg	0.464	0.464	1	A
Aldrin	ND		ug/kg	0.464	0.464	1	A
Heptachlor epoxide	ND		ug/kg	0.928	0.928	1	B
Oxychlordane	ND		ug/kg	0.928	0.928	1	B
trans-Chlordane	ND		ug/kg	0.464	0.464	1	A
Endosulfan I	ND		ug/kg	0.464	0.464	1	A
cis-Chlordane	ND		ug/kg	0.464	0.464	1	A
trans-Nonachlor	ND		ug/kg	0.464	0.464	1	B
4,4'-DDE	ND		ug/kg	0.464	0.464	1	A
Dieldrin	ND		ug/kg	0.464	0.464	1	A
Endrin	ND		ug/kg	0.464	0.464	1	A
Endosulfan II	ND		ug/kg	0.464	0.464	1	A
4,4'-DDD	ND		ug/kg	0.464	0.464	1	A
cis-Nonachlor	ND		ug/kg	0.464	0.464	1	A
4,4'-DDT	ND		ug/kg	0.464	0.464	1	A
Methoxychlor	ND		ug/kg	1.86	1.86	1	A
Toxaphene	ND		ug/kg	23.3	23.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	80		30-150	B
BZ 198	86		30-150	B
DBOB	120		30-150	A
BZ 198	75		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-11
 Client ID: B567R01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 23:02
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.911	0.911	1	A
gamma-BHC	ND		ug/kg	0.455	0.455	1	A
Heptachlor	ND		ug/kg	0.455	0.455	1	A
Aldrin	ND		ug/kg	0.455	0.455	1	A
Heptachlor epoxide	ND		ug/kg	0.911	0.911	1	B
Oxychlorane	ND		ug/kg	0.911	0.911	1	B
trans-Chlordane	ND		ug/kg	0.455	0.455	1	A
Endosulfan I	ND		ug/kg	0.455	0.455	1	A
cis-Chlordane	ND		ug/kg	0.455	0.455	1	A
trans-Nonachlor	ND		ug/kg	0.455	0.455	1	B
4,4'-DDE	ND		ug/kg	0.455	0.455	1	B
Dieldrin	ND		ug/kg	0.455	0.455	1	A
Endrin	ND		ug/kg	0.455	0.455	1	A
Endosulfan II	ND		ug/kg	0.455	0.455	1	A
4,4'-DDD	ND		ug/kg	0.455	0.455	1	A
cis-Nonachlor	ND		ug/kg	0.455	0.455	1	A
4,4'-DDT	ND		ug/kg	0.455	0.455	1	A
Methoxychlor	ND		ug/kg	1.82	1.82	1	A
Toxaphene	ND		ug/kg	22.8	22.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	80		30-150	B
BZ 198	81		30-150	B
DBOB	87		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-12
 Client ID: B567R01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 23:36
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.859	0.859	1	A
gamma-BHC	ND		ug/kg	0.430	0.430	1	A
Heptachlor	ND		ug/kg	0.430	0.430	1	A
Aldrin	ND		ug/kg	0.430	0.430	1	A
Heptachlor epoxide	ND		ug/kg	0.859	0.859	1	B
Oxychlordane	ND		ug/kg	0.859	0.859	1	B
trans-Chlordane	ND		ug/kg	0.430	0.430	1	A
Endosulfan I	ND		ug/kg	0.430	0.430	1	A
cis-Chlordane	ND		ug/kg	0.430	0.430	1	A
trans-Nonachlor	ND		ug/kg	0.430	0.430	1	B
4,4'-DDE	ND		ug/kg	0.430	0.430	1	B
Dieldrin	ND		ug/kg	0.430	0.430	1	A
Endrin	ND		ug/kg	0.430	0.430	1	A
Endosulfan II	ND		ug/kg	0.430	0.430	1	A
4,4'-DDD	ND		ug/kg	0.430	0.430	1	A
cis-Nonachlor	ND		ug/kg	0.430	0.430	1	A
4,4'-DDT	ND		ug/kg	0.430	0.430	1	A
Methoxychlor	ND		ug/kg	1.72	1.72	1	A
Toxaphene	ND		ug/kg	21.6	21.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	72		30-150	B
BZ 198	73		30-150	B
DBOB	80		30-150	A
BZ 198	62		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-13
 Client ID: B567R01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 00:10
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.945	0.945	1	A
gamma-BHC	ND		ug/kg	0.472	0.472	1	A
Heptachlor	ND		ug/kg	0.472	0.472	1	A
Aldrin	ND		ug/kg	0.472	0.472	1	A
Heptachlor epoxide	ND		ug/kg	0.945	0.945	1	B
Oxychlorane	ND		ug/kg	0.945	0.945	1	B
trans-Chlordane	ND		ug/kg	0.472	0.472	1	A
Endosulfan I	ND		ug/kg	0.472	0.472	1	A
cis-Chlordane	ND		ug/kg	0.472	0.472	1	A
trans-Nonachlor	ND		ug/kg	0.472	0.472	1	B
4,4'-DDE	ND		ug/kg	0.472	0.472	1	A
Dieldrin	ND		ug/kg	0.472	0.472	1	A
Endrin	ND		ug/kg	0.472	0.472	1	A
Endosulfan II	ND		ug/kg	0.472	0.472	1	A
4,4'-DDD	ND		ug/kg	0.472	0.472	1	A
cis-Nonachlor	ND		ug/kg	0.472	0.472	1	A
4,4'-DDT	ND		ug/kg	0.472	0.472	1	A
Methoxychlor	ND		ug/kg	1.89	1.89	1	A
Toxaphene	ND		ug/kg	23.7	23.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	66		30-150	B
BZ 198	75		30-150	B
DBOB	69		30-150	A
BZ 198	64		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-14
 Client ID: B567R01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 00:44
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.947	0.947	1	A
gamma-BHC	ND		ug/kg	0.473	0.473	1	A
Heptachlor	ND		ug/kg	0.473	0.473	1	A
Aldrin	ND		ug/kg	0.473	0.473	1	A
Heptachlor epoxide	ND		ug/kg	0.947	0.947	1	B
Oxychlorodane	ND		ug/kg	0.947	0.947	1	B
trans-Chlordane	ND		ug/kg	0.473	0.473	1	A
Endosulfan I	ND		ug/kg	0.473	0.473	1	A
cis-Chlordane	ND		ug/kg	0.473	0.473	1	A
trans-Nonachlor	ND		ug/kg	0.473	0.473	1	B
4,4'-DDE	ND		ug/kg	0.473	0.473	1	B
Dieldrin	ND		ug/kg	0.473	0.473	1	A
Endrin	ND		ug/kg	0.473	0.473	1	A
Endosulfan II	ND		ug/kg	0.473	0.473	1	A
4,4'-DDD	ND		ug/kg	0.473	0.473	1	A
cis-Nonachlor	ND		ug/kg	0.473	0.473	1	A
4,4'-DDT	ND		ug/kg	0.473	0.473	1	A
Methoxychlor	ND		ug/kg	1.89	1.89	1	A
Toxaphene	ND		ug/kg	23.8	23.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	B
BZ 198	75		30-150	B
DBOB	71		30-150	A
BZ 198	59		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-15
 Client ID: B567R01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 01:18
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:34
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.943	0.943	1	A
gamma-BHC	ND		ug/kg	0.472	0.472	1	A
Heptachlor	ND		ug/kg	0.472	0.472	1	A
Aldrin	ND		ug/kg	0.472	0.472	1	A
Heptachlor epoxide	ND		ug/kg	0.943	0.943	1	B
Oxychlordane	ND		ug/kg	0.943	0.943	1	B
trans-Chlordane	ND		ug/kg	0.472	0.472	1	A
Endosulfan I	ND		ug/kg	0.472	0.472	1	A
cis-Chlordane	ND		ug/kg	0.472	0.472	1	A
trans-Nonachlor	ND		ug/kg	0.472	0.472	1	B
4,4'-DDE	ND		ug/kg	0.472	0.472	1	B
Dieldrin	ND		ug/kg	0.472	0.472	1	A
Endrin	ND		ug/kg	0.472	0.472	1	A
Endosulfan II	ND		ug/kg	0.472	0.472	1	A
4,4'-DDD	ND		ug/kg	0.472	0.472	1	A
cis-Nonachlor	ND		ug/kg	0.472	0.472	1	A
4,4'-DDT	ND		ug/kg	0.472	0.472	1	A
Methoxychlor	ND		ug/kg	1.89	1.89	1	A
Toxaphene	ND		ug/kg	23.7	23.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	65		30-150	B
BZ 198	63		30-150	B
DBOB	78		30-150	A
BZ 198	58		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-16
 Client ID: B567S01NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 01:51
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:31
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.865	0.865	1	A
gamma-BHC	ND		ug/kg	0.432	0.432	1	A
Heptachlor	ND		ug/kg	0.432	0.432	1	A
Aldrin	ND		ug/kg	0.432	0.432	1	A
Heptachlor epoxide	ND		ug/kg	0.865	0.865	1	B
Oxychlorane	ND		ug/kg	0.865	0.865	1	B
trans-Chlordane	ND		ug/kg	0.432	0.432	1	A
Endosulfan I	ND		ug/kg	0.432	0.432	1	A
cis-Chlordane	ND		ug/kg	0.432	0.432	1	A
trans-Nonachlor	ND		ug/kg	0.432	0.432	1	B
4,4'-DDE	ND		ug/kg	0.432	0.432	1	A
Dieldrin	ND		ug/kg	0.432	0.432	1	A
Endrin	ND		ug/kg	0.432	0.432	1	A
Endosulfan II	ND		ug/kg	0.432	0.432	1	A
4,4'-DDD	ND		ug/kg	0.432	0.432	1	A
cis-Nonachlor	ND		ug/kg	0.432	0.432	1	A
4,4'-DDT	ND		ug/kg	0.432	0.432	1	A
Methoxychlor	ND		ug/kg	1.73	1.73	1	A
Toxaphene	ND		ug/kg	21.7	21.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	75		30-150	B
BZ 198	106		30-150	B
DBOB	78		30-150	A
BZ 198	66		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-17
 Client ID: B567S01NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 02:25
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:31
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.877	0.877	1	A
gamma-BHC	ND		ug/kg	0.438	0.438	1	A
Heptachlor	ND		ug/kg	0.438	0.438	1	A
Aldrin	ND		ug/kg	0.438	0.438	1	A
Heptachlor epoxide	ND		ug/kg	0.877	0.877	1	B
Oxychlorane	ND		ug/kg	0.877	0.877	1	B
trans-Chlordane	ND		ug/kg	0.438	0.438	1	A
Endosulfan I	ND		ug/kg	0.438	0.438	1	A
cis-Chlordane	ND		ug/kg	0.438	0.438	1	A
trans-Nonachlor	ND		ug/kg	0.438	0.438	1	B
4,4'-DDE	ND		ug/kg	0.438	0.438	1	A
Dieldrin	ND		ug/kg	0.438	0.438	1	A
Endrin	ND		ug/kg	0.438	0.438	1	A
Endosulfan II	ND		ug/kg	0.438	0.438	1	A
4,4'-DDD	ND		ug/kg	0.438	0.438	1	A
cis-Nonachlor	ND		ug/kg	0.438	0.438	1	A
4,4'-DDT	1.22	IP	ug/kg	0.438	0.438	1	A
Methoxychlor	ND		ug/kg	1.75	1.75	1	A
Toxaphene	ND		ug/kg	22.0	22.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	70		30-150	B
BZ 198	74		30-150	B
DBOB	75		30-150	A
BZ 198	62		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-18
 Client ID: B567S01NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 02:59
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:31
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.988	0.988	1	A
gamma-BHC	ND		ug/kg	0.494	0.494	1	A
Heptachlor	ND		ug/kg	0.494	0.494	1	A
Aldrin	ND		ug/kg	0.494	0.494	1	A
Heptachlor epoxide	ND		ug/kg	0.988	0.988	1	B
Oxychlordane	ND		ug/kg	0.988	0.988	1	B
trans-Chlordane	ND		ug/kg	0.494	0.494	1	A
Endosulfan I	ND		ug/kg	0.494	0.494	1	A
cis-Chlordane	ND		ug/kg	0.494	0.494	1	A
trans-Nonachlor	ND		ug/kg	0.494	0.494	1	B
4,4'-DDE	ND		ug/kg	0.494	0.494	1	B
Dieldrin	ND		ug/kg	0.494	0.494	1	A
Endrin	ND		ug/kg	0.494	0.494	1	A
Endosulfan II	ND		ug/kg	0.494	0.494	1	A
4,4'-DDD	ND		ug/kg	0.494	0.494	1	A
cis-Nonachlor	ND		ug/kg	0.494	0.494	1	A
4,4'-DDT	ND		ug/kg	0.494	0.494	1	A
Methoxychlor	ND		ug/kg	1.98	1.98	1	A
Toxaphene	ND		ug/kg	24.8	24.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	76		30-150	B
BZ 198	77		30-150	B
DBOB	79		30-150	A
BZ 198	64		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-19
 Client ID: B567S01NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 03:33
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:31
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.865	0.865	1	A
gamma-BHC	ND		ug/kg	0.432	0.432	1	A
Heptachlor	ND		ug/kg	0.432	0.432	1	A
Aldrin	ND		ug/kg	0.432	0.432	1	A
Heptachlor epoxide	ND		ug/kg	0.865	0.865	1	B
Oxychlorodane	ND		ug/kg	0.865	0.865	1	B
trans-Chlordane	ND		ug/kg	0.432	0.432	1	A
Endosulfan I	ND		ug/kg	0.432	0.432	1	A
cis-Chlordane	ND		ug/kg	0.432	0.432	1	A
trans-Nonachlor	ND		ug/kg	0.432	0.432	1	B
4,4'-DDE	ND		ug/kg	0.432	0.432	1	A
Dieldrin	ND		ug/kg	0.432	0.432	1	A
Endrin	ND		ug/kg	0.432	0.432	1	A
Endosulfan II	ND		ug/kg	0.432	0.432	1	A
4,4'-DDD	ND		ug/kg	0.432	0.432	1	A
cis-Nonachlor	ND		ug/kg	0.432	0.432	1	A
4,4'-DDT	ND		ug/kg	0.432	0.432	1	A
Methoxychlor	ND		ug/kg	1.73	1.73	1	A
Toxaphene	ND		ug/kg	21.7	21.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	77		30-150	B
BZ 198	75		30-150	B
DBOB	81		30-150	A
BZ 198	65		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-20
 Client ID: B567S01NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 04:07
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 10:31
 Cleanup Method: EPA 3630
 Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.976	0.976	1	A
gamma-BHC	ND		ug/kg	0.488	0.488	1	A
Heptachlor	ND		ug/kg	0.488	0.488	1	A
Aldrin	ND		ug/kg	0.488	0.488	1	A
Heptachlor epoxide	ND		ug/kg	0.976	0.976	1	B
Oxychlorane	ND		ug/kg	0.976	0.976	1	B
trans-Chlordane	ND		ug/kg	0.488	0.488	1	A
Endosulfan I	ND		ug/kg	0.488	0.488	1	A
cis-Chlordane	ND		ug/kg	0.488	0.488	1	A
trans-Nonachlor	ND		ug/kg	0.488	0.488	1	B
4,4'-DDE	ND		ug/kg	0.488	0.488	1	B
Dieldrin	ND		ug/kg	0.488	0.488	1	A
Endrin	ND		ug/kg	0.488	0.488	1	A
Endosulfan II	ND		ug/kg	0.488	0.488	1	A
4,4'-DDD	ND		ug/kg	0.488	0.488	1	A
cis-Nonachlor	ND		ug/kg	0.488	0.488	1	A
4,4'-DDT	ND		ug/kg	0.488	0.488	1	A
Methoxychlor	ND		ug/kg	1.95	1.95	1	A
Toxaphene	ND		ug/kg	24.5	24.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	68		30-150	B
BZ 198	74		30-150	B
DBOB	78		30-150	A
BZ 198	71		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-21
 Client ID: B567S02NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 21:04
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.898	0.898	1	A
gamma-BHC	ND		ug/kg	0.449	0.449	1	A
Heptachlor	ND		ug/kg	0.449	0.449	1	A
Aldrin	ND		ug/kg	0.449	0.449	1	A
Heptachlor epoxide	ND		ug/kg	0.898	0.898	1	B
Oxychlorane	ND		ug/kg	0.898	0.898	1	B
trans-Chlordane	0.494		ug/kg	0.449	0.449	1	B
Endosulfan I	ND		ug/kg	0.449	0.449	1	A
cis-Chlordane	ND		ug/kg	0.449	0.449	1	A
trans-Nonachlor	ND		ug/kg	0.449	0.449	1	B
4,4'-DDE	ND		ug/kg	0.449	0.449	1	B
Dieldrin	ND		ug/kg	0.449	0.449	1	A
Endrin	ND		ug/kg	0.449	0.449	1	A
Endosulfan II	ND		ug/kg	0.449	0.449	1	A
4,4'-DDD	ND		ug/kg	0.449	0.449	1	A
cis-Nonachlor	ND		ug/kg	0.449	0.449	1	A
4,4'-DDT	ND		ug/kg	0.449	0.449	1	A
Methoxychlor	ND		ug/kg	1.80	1.80	1	A
Toxaphene	ND		ug/kg	22.5	22.5	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	97		30-150	B
BZ 198	125		30-150	B
DBOB	89		30-150	A
BZ 198	85		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-22
 Client ID: B567S02NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 22:45
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.969	0.969	1	A
gamma-BHC	ND		ug/kg	0.484	0.484	1	A
Heptachlor	ND		ug/kg	0.484	0.484	1	A
Aldrin	ND		ug/kg	0.484	0.484	1	A
Heptachlor epoxide	ND		ug/kg	0.969	0.969	1	B
Oxychlordane	ND		ug/kg	0.969	0.969	1	B
trans-Chlordane	ND		ug/kg	0.484	0.484	1	A
Endosulfan I	ND		ug/kg	0.484	0.484	1	A
cis-Chlordane	ND		ug/kg	0.484	0.484	1	A
trans-Nonachlor	ND		ug/kg	0.484	0.484	1	B
4,4'-DDE	0.484	P	ug/kg	0.484	0.484	1	A
Dieldrin	ND		ug/kg	0.484	0.484	1	A
Endrin	ND		ug/kg	0.484	0.484	1	A
Endosulfan II	ND		ug/kg	0.484	0.484	1	A
4,4'-DDD	ND		ug/kg	0.484	0.484	1	A
cis-Nonachlor	ND		ug/kg	0.484	0.484	1	A
4,4'-DDT	ND		ug/kg	0.484	0.484	1	A
Methoxychlor	ND		ug/kg	1.94	1.94	1	A
Toxaphene	ND		ug/kg	24.3	24.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	89		30-150	B
BZ 198	71		30-150	B
DBOB	75		30-150	A
BZ 198	67		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-23
 Client ID: B567S02NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/15/19 23:51
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.864	0.864	1	A
gamma-BHC	ND		ug/kg	0.432	0.432	1	A
Heptachlor	ND		ug/kg	0.432	0.432	1	A
Aldrin	ND		ug/kg	0.432	0.432	1	A
Heptachlor epoxide	ND		ug/kg	0.864	0.864	1	B
Oxychlorane	ND		ug/kg	0.864	0.864	1	B
trans-Chlordane	ND		ug/kg	0.432	0.432	1	A
Endosulfan I	ND		ug/kg	0.432	0.432	1	A
cis-Chlordane	ND		ug/kg	0.432	0.432	1	A
trans-Nonachlor	ND		ug/kg	0.432	0.432	1	B
4,4'-DDE	ND		ug/kg	0.432	0.432	1	A
Dieldrin	ND		ug/kg	0.432	0.432	1	A
Endrin	ND		ug/kg	0.432	0.432	1	A
Endosulfan II	ND		ug/kg	0.432	0.432	1	A
4,4'-DDD	ND		ug/kg	0.432	0.432	1	A
cis-Nonachlor	ND		ug/kg	0.432	0.432	1	A
4,4'-DDT	ND		ug/kg	0.432	0.432	1	A
Methoxychlor	ND		ug/kg	1.73	1.73	1	A
Toxaphene	ND		ug/kg	21.7	21.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	61		30-150	B
BZ 198	57		30-150	B
DBOB	56		30-150	A
BZ 198	52		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-24
 Client ID: B567S02NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 00:25
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.994	0.994	1	A
gamma-BHC	ND		ug/kg	0.497	0.497	1	A
Heptachlor	ND		ug/kg	0.497	0.497	1	A
Aldrin	ND		ug/kg	0.497	0.497	1	A
Heptachlor epoxide	ND		ug/kg	0.994	0.994	1	B
Oxychlordane	ND		ug/kg	0.994	0.994	1	B
trans-Chlordane	ND		ug/kg	0.497	0.497	1	A
Endosulfan I	ND		ug/kg	0.497	0.497	1	A
cis-Chlordane	ND		ug/kg	0.497	0.497	1	A
trans-Nonachlor	ND		ug/kg	0.497	0.497	1	A
4,4'-DDE	ND		ug/kg	0.497	0.497	1	A
Dieldrin	ND		ug/kg	0.497	0.497	1	A
Endrin	ND		ug/kg	0.497	0.497	1	A
Endosulfan II	ND		ug/kg	0.497	0.497	1	A
4,4'-DDD	ND		ug/kg	0.497	0.497	1	A
cis-Nonachlor	ND		ug/kg	0.497	0.497	1	A
4,4'-DDT	ND		ug/kg	0.497	0.497	1	A
Methoxychlor	ND		ug/kg	1.99	1.99	1	A
Toxaphene	ND		ug/kg	25.0	25.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	67		30-150	B
BZ 198	60		30-150	B
DBOB	62		30-150	A
BZ 198	58		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-25
 Client ID: B567S02NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 00:58
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.960	0.960	1	A
gamma-BHC	ND		ug/kg	0.480	0.480	1	A
Heptachlor	ND		ug/kg	0.480	0.480	1	A
Aldrin	ND		ug/kg	0.480	0.480	1	A
Heptachlor epoxide	ND		ug/kg	0.960	0.960	1	B
Oxychlorane	ND		ug/kg	0.960	0.960	1	B
trans-Chlordane	ND		ug/kg	0.480	0.480	1	B
Endosulfan I	ND		ug/kg	0.480	0.480	1	A
cis-Chlordane	ND		ug/kg	0.480	0.480	1	A
trans-Nonachlor	ND		ug/kg	0.480	0.480	1	A
4,4'-DDE	ND		ug/kg	0.480	0.480	1	A
Dieldrin	ND		ug/kg	0.480	0.480	1	A
Endrin	ND		ug/kg	0.480	0.480	1	A
Endosulfan II	ND		ug/kg	0.480	0.480	1	A
4,4'-DDD	ND		ug/kg	0.480	0.480	1	A
cis-Nonachlor	ND		ug/kg	0.480	0.480	1	A
4,4'-DDT	ND		ug/kg	0.480	0.480	1	A
Methoxychlor	ND		ug/kg	1.92	1.92	1	A
Toxaphene	ND		ug/kg	24.1	24.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	69		30-150	B
BZ 198	59		30-150	B
DBOB	62		30-150	A
BZ 198	57		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-26
 Client ID: B567S03NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 01:32
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.894	0.894	1	A
gamma-BHC	ND		ug/kg	0.447	0.447	1	A
Heptachlor	ND		ug/kg	0.447	0.447	1	A
Aldrin	ND		ug/kg	0.447	0.447	1	A
Heptachlor epoxide	ND		ug/kg	0.894	0.894	1	B
Oxychlordane	ND		ug/kg	0.894	0.894	1	B
trans-Chlordane	0.493		ug/kg	0.447	0.447	1	B
Endosulfan I	ND		ug/kg	0.447	0.447	1	A
cis-Chlordane	ND		ug/kg	0.447	0.447	1	A
trans-Nonachlor	ND		ug/kg	0.447	0.447	1	B
4,4'-DDE	ND		ug/kg	0.447	0.447	1	A
Dieldrin	ND		ug/kg	0.447	0.447	1	A
Endrin	ND		ug/kg	0.447	0.447	1	A
Endosulfan II	ND		ug/kg	0.447	0.447	1	A
4,4'-DDD	ND		ug/kg	0.447	0.447	1	A
cis-Nonachlor	ND		ug/kg	0.447	0.447	1	A
4,4'-DDT	ND		ug/kg	0.447	0.447	1	A
Methoxychlor	ND		ug/kg	1.79	1.79	1	A
Toxaphene	ND		ug/kg	22.4	22.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	96		30-150	B
BZ 198	77		30-150	B
DBOB	78		30-150	A
BZ 198	75		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-27
 Client ID: B567S03NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 02:05
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	4.47	P	ug/kg	0.907	0.907	1	B
gamma-BHC	2.45	P	ug/kg	0.454	0.454	1	B
Heptachlor	0.645		ug/kg	0.454	0.454	1	B
Aldrin	0.526		ug/kg	0.454	0.454	1	B
Heptachlor epoxide	ND		ug/kg	0.907	0.907	1	B
Oxychlorane	ND		ug/kg	0.907	0.907	1	B
trans-Chlordane	ND		ug/kg	0.454	0.454	1	B
Endosulfan I	1.60	P	ug/kg	0.454	0.454	1	A
cis-Chlordane	1.56	P	ug/kg	0.454	0.454	1	A
trans-Nonachlor	ND		ug/kg	0.454	0.454	1	B
4,4'-DDE	ND		ug/kg	0.454	0.454	1	B
Dieldrin	0.937		ug/kg	0.454	0.454	1	B
Endrin	ND		ug/kg	0.454	0.454	1	B
Endosulfan II	1.33		ug/kg	0.454	0.454	1	B
4,4'-DDD	ND		ug/kg	0.454	0.454	1	B
cis-Nonachlor	1.48	P	ug/kg	0.454	0.454	1	B
4,4'-DDT	2.25		ug/kg	0.454	0.454	1	B
Methoxychlor	ND		ug/kg	1.81	1.81	1	A
Toxaphene	ND		ug/kg	22.8	22.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	112		30-150	B
BZ 198	68		30-150	B
DBOB	60		30-150	A
BZ 198	59		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-28
 Client ID: B567S03NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 02:39
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.886	0.886	1	A
gamma-BHC	ND		ug/kg	0.443	0.443	1	A
Heptachlor	ND		ug/kg	0.443	0.443	1	A
Aldrin	ND		ug/kg	0.443	0.443	1	A
Heptachlor epoxide	ND		ug/kg	0.886	0.886	1	B
Oxychlorane	ND		ug/kg	0.886	0.886	1	B
trans-Chlordane	0.470		ug/kg	0.443	0.443	1	B
Endosulfan I	ND		ug/kg	0.443	0.443	1	A
cis-Chlordane	ND		ug/kg	0.443	0.443	1	A
trans-Nonachlor	ND		ug/kg	0.443	0.443	1	B
4,4'-DDE	ND		ug/kg	0.443	0.443	1	A
Dieldrin	ND		ug/kg	0.443	0.443	1	A
Endrin	ND		ug/kg	0.443	0.443	1	A
Endosulfan II	ND		ug/kg	0.443	0.443	1	A
4,4'-DDD	ND		ug/kg	0.443	0.443	1	A
cis-Nonachlor	ND		ug/kg	0.443	0.443	1	A
4,4'-DDT	ND		ug/kg	0.443	0.443	1	A
Methoxychlor	ND		ug/kg	1.77	1.77	1	A
Toxaphene	ND		ug/kg	22.2	22.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	97		30-150	B
BZ 198	80		30-150	B
DBOB	90		30-150	A
BZ 198	73		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-29
 Client ID: B567S03NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 03:12
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.917	0.917	1	A
gamma-BHC	ND		ug/kg	0.459	0.459	1	A
Heptachlor	ND		ug/kg	0.459	0.459	1	A
Aldrin	ND		ug/kg	0.459	0.459	1	A
Heptachlor epoxide	ND		ug/kg	0.917	0.917	1	B
Oxychlorane	ND		ug/kg	0.917	0.917	1	B
trans-Chlordane	ND		ug/kg	0.459	0.459	1	A
Endosulfan I	ND		ug/kg	0.459	0.459	1	A
cis-Chlordane	ND		ug/kg	0.459	0.459	1	A
trans-Nonachlor	ND		ug/kg	0.459	0.459	1	B
4,4'-DDE	ND		ug/kg	0.459	0.459	1	A
Dieldrin	ND		ug/kg	0.459	0.459	1	A
Endrin	ND		ug/kg	0.459	0.459	1	A
Endosulfan II	ND		ug/kg	0.459	0.459	1	A
4,4'-DDD	ND		ug/kg	0.459	0.459	1	A
cis-Nonachlor	ND		ug/kg	0.459	0.459	1	A
4,4'-DDT	ND		ug/kg	0.459	0.459	1	A
Methoxychlor	ND		ug/kg	1.83	1.83	1	A
Toxaphene	ND		ug/kg	23.0	23.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	76		30-150	B
BZ 198	64		30-150	B
DBOB	75		30-150	A
BZ 198	62		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-30
 Client ID: B567S03NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 03:46
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.886	0.886	1	A
gamma-BHC	ND		ug/kg	0.443	0.443	1	A
Heptachlor	ND		ug/kg	0.443	0.443	1	A
Aldrin	ND		ug/kg	0.443	0.443	1	A
Heptachlor epoxide	ND		ug/kg	0.886	0.886	1	B
Oxychlorodane	ND		ug/kg	0.886	0.886	1	B
trans-Chlordane	0.566		ug/kg	0.443	0.443	1	B
Endosulfan I	ND		ug/kg	0.443	0.443	1	A
cis-Chlordane	ND		ug/kg	0.443	0.443	1	A
trans-Nonachlor	ND		ug/kg	0.443	0.443	1	B
4,4'-DDE	ND		ug/kg	0.443	0.443	1	A
Dieldrin	1.68	P	ug/kg	0.443	0.443	1	B
Endrin	ND		ug/kg	0.443	0.443	1	A
Endosulfan II	ND		ug/kg	0.443	0.443	1	A
4,4'-DDD	ND		ug/kg	0.443	0.443	1	A
cis-Nonachlor	ND		ug/kg	0.443	0.443	1	A
4,4'-DDT	ND		ug/kg	0.443	0.443	1	A
Methoxychlor	ND		ug/kg	1.77	1.77	1	A
Toxaphene	ND		ug/kg	22.2	22.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	90		30-150	B
BZ 198	86		30-150	B
DBOB	91		30-150	A
BZ 198	79		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-31
 Client ID: B567S04NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 04:19
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.965	0.965	1	A
gamma-BHC	ND		ug/kg	0.483	0.483	1	A
Heptachlor	ND		ug/kg	0.483	0.483	1	A
Aldrin	ND		ug/kg	0.483	0.483	1	A
Heptachlor epoxide	ND		ug/kg	0.965	0.965	1	B
Oxychlorane	ND		ug/kg	0.965	0.965	1	B
trans-Chlordane	ND		ug/kg	0.483	0.483	1	A
Endosulfan I	ND		ug/kg	0.483	0.483	1	A
cis-Chlordane	ND		ug/kg	0.483	0.483	1	A
trans-Nonachlor	ND		ug/kg	0.483	0.483	1	A
4,4'-DDE	ND		ug/kg	0.483	0.483	1	A
Dieldrin	ND		ug/kg	0.483	0.483	1	A
Endrin	ND		ug/kg	0.483	0.483	1	A
Endosulfan II	ND		ug/kg	0.483	0.483	1	A
4,4'-DDD	ND		ug/kg	0.483	0.483	1	A
cis-Nonachlor	ND		ug/kg	0.483	0.483	1	A
4,4'-DDT	ND		ug/kg	0.483	0.483	1	A
Methoxychlor	ND		ug/kg	1.93	1.93	1	A
Toxaphene	ND		ug/kg	24.2	24.2	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	75		30-150	B
BZ 198	68		30-150	B
DBOB	72		30-150	A
BZ 198	67		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-32
 Client ID: B567S04NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 04:52
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.933	0.933	1	A
gamma-BHC	ND		ug/kg	0.466	0.466	1	A
Heptachlor	ND		ug/kg	0.466	0.466	1	A
Aldrin	ND		ug/kg	0.466	0.466	1	A
Heptachlor epoxide	ND		ug/kg	0.933	0.933	1	B
Oxychlorane	ND		ug/kg	0.933	0.933	1	B
trans-Chlordane	ND		ug/kg	0.466	0.466	1	A
Endosulfan I	ND		ug/kg	0.466	0.466	1	A
cis-Chlordane	ND		ug/kg	0.466	0.466	1	A
trans-Nonachlor	ND		ug/kg	0.466	0.466	1	B
4,4'-DDE	ND		ug/kg	0.466	0.466	1	A
Dieldrin	ND		ug/kg	0.466	0.466	1	A
Endrin	ND		ug/kg	0.466	0.466	1	A
Endosulfan II	ND		ug/kg	0.466	0.466	1	A
4,4'-DDD	ND		ug/kg	0.466	0.466	1	A
cis-Nonachlor	ND		ug/kg	0.466	0.466	1	A
4,4'-DDT	ND		ug/kg	0.466	0.466	1	A
Methoxychlor	ND		ug/kg	1.86	1.86	1	A
Toxaphene	ND		ug/kg	23.4	23.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	72		30-150	B
BZ 198	64		30-150	B
DBOB	64		30-150	A
BZ 198	63		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-33
 Client ID: B567S04NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 05:26
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.954	0.954	1	A
gamma-BHC	ND		ug/kg	0.477	0.477	1	A
Heptachlor	ND		ug/kg	0.477	0.477	1	A
Aldrin	ND		ug/kg	0.477	0.477	1	A
Heptachlor epoxide	ND		ug/kg	0.954	0.954	1	B
Oxychlorane	ND		ug/kg	0.954	0.954	1	B
trans-Chlordane	ND		ug/kg	0.477	0.477	1	A
Endosulfan I	ND		ug/kg	0.477	0.477	1	A
cis-Chlordane	ND		ug/kg	0.477	0.477	1	A
trans-Nonachlor	ND		ug/kg	0.477	0.477	1	A
4,4'-DDE	ND		ug/kg	0.477	0.477	1	A
Dieldrin	ND		ug/kg	0.477	0.477	1	A
Endrin	ND		ug/kg	0.477	0.477	1	A
Endosulfan II	ND		ug/kg	0.477	0.477	1	A
4,4'-DDD	ND		ug/kg	0.477	0.477	1	A
cis-Nonachlor	ND		ug/kg	0.477	0.477	1	A
4,4'-DDT	ND		ug/kg	0.477	0.477	1	A
Methoxychlor	ND		ug/kg	1.91	1.91	1	A
Toxaphene	ND		ug/kg	24.0	24.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	65		30-150	B
BZ 198	62		30-150	B
DBOB	61		30-150	A
BZ 198	55		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-34
 Client ID: B567S04NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 05:59
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.967	0.967	1	A
gamma-BHC	ND		ug/kg	0.484	0.484	1	A
Heptachlor	ND		ug/kg	0.484	0.484	1	A
Aldrin	ND		ug/kg	0.484	0.484	1	A
Heptachlor epoxide	ND		ug/kg	0.967	0.967	1	B
Oxychlorane	ND		ug/kg	0.967	0.967	1	B
trans-Chlordane	ND		ug/kg	0.484	0.484	1	A
Endosulfan I	ND		ug/kg	0.484	0.484	1	A
cis-Chlordane	ND		ug/kg	0.484	0.484	1	A
trans-Nonachlor	ND		ug/kg	0.484	0.484	1	A
4,4'-DDE	ND		ug/kg	0.484	0.484	1	A
Dieldrin	ND		ug/kg	0.484	0.484	1	A
Endrin	ND		ug/kg	0.484	0.484	1	A
Endosulfan II	ND		ug/kg	0.484	0.484	1	A
4,4'-DDD	ND		ug/kg	0.484	0.484	1	A
cis-Nonachlor	ND		ug/kg	0.484	0.484	1	A
4,4'-DDT	ND		ug/kg	0.484	0.484	1	A
Methoxychlor	ND		ug/kg	1.93	1.93	1	A
Toxaphene	ND		ug/kg	24.3	24.3	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	78		30-150	B
BZ 198	71		30-150	B
DBOB	78		30-150	A
BZ 198	71		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-35
 Client ID: B567S04NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 06:33
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.945	0.945	1	A
gamma-BHC	ND		ug/kg	0.472	0.472	1	A
Heptachlor	ND		ug/kg	0.472	0.472	1	A
Aldrin	ND		ug/kg	0.472	0.472	1	A
Heptachlor epoxide	ND		ug/kg	0.945	0.945	1	B
Oxychlorodane	ND		ug/kg	0.945	0.945	1	B
trans-Chlordane	ND		ug/kg	0.472	0.472	1	A
Endosulfan I	ND		ug/kg	0.472	0.472	1	A
cis-Chlordane	ND		ug/kg	0.472	0.472	1	A
trans-Nonachlor	ND		ug/kg	0.472	0.472	1	B
4,4'-DDE	ND		ug/kg	0.472	0.472	1	A
Dieldrin	ND		ug/kg	0.472	0.472	1	A
Endrin	ND		ug/kg	0.472	0.472	1	A
Endosulfan II	ND		ug/kg	0.472	0.472	1	A
4,4'-DDD	ND		ug/kg	0.472	0.472	1	A
cis-Nonachlor	ND		ug/kg	0.472	0.472	1	A
4,4'-DDT	ND		ug/kg	0.472	0.472	1	A
Methoxychlor	ND		ug/kg	1.89	1.89	1	A
Toxaphene	ND		ug/kg	23.7	23.7	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	86		30-150	B
BZ 198	72		30-150	B
DBOB	75		30-150	A
BZ 198	70		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-36
 Client ID: B567S05NVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 07:06
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.956	0.956	1	A
gamma-BHC	ND		ug/kg	0.478	0.478	1	A
Heptachlor	ND		ug/kg	0.478	0.478	1	A
Aldrin	ND		ug/kg	0.478	0.478	1	A
Heptachlor epoxide	ND		ug/kg	0.956	0.956	1	B
Oxychlordane	ND		ug/kg	0.956	0.956	1	B
trans-Chlordane	ND		ug/kg	0.478	0.478	1	A
Endosulfan I	ND		ug/kg	0.478	0.478	1	A
cis-Chlordane	ND		ug/kg	0.478	0.478	1	A
trans-Nonachlor	ND		ug/kg	0.478	0.478	1	B
4,4'-DDE	ND		ug/kg	0.478	0.478	1	A
Dieldrin	ND		ug/kg	0.478	0.478	1	A
Endrin	ND		ug/kg	0.478	0.478	1	A
Endosulfan II	ND		ug/kg	0.478	0.478	1	A
4,4'-DDD	ND		ug/kg	0.478	0.478	1	A
cis-Nonachlor	ND		ug/kg	0.478	0.478	1	A
4,4'-DDT	ND		ug/kg	0.478	0.478	1	A
Methoxychlor	ND		ug/kg	1.91	1.91	1	A
Toxaphene	ND		ug/kg	24.0	24.0	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	82		30-150	B
BZ 198	76		30-150	B
DBOB	83		30-150	A
BZ 198	74		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-37
 Client ID: B567S05NVB
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 19:03
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.949	0.949	1	A
gamma-BHC	ND		ug/kg	0.474	0.474	1	A
Heptachlor	ND		ug/kg	0.474	0.474	1	A
Aldrin	ND		ug/kg	0.474	0.474	1	A
Heptachlor epoxide	ND		ug/kg	0.949	0.949	1	B
Oxychlorane	ND		ug/kg	0.949	0.949	1	B
trans-Chlordane	ND		ug/kg	0.474	0.474	1	A
Endosulfan I	ND		ug/kg	0.474	0.474	1	A
cis-Chlordane	ND		ug/kg	0.474	0.474	1	A
trans-Nonachlor	ND		ug/kg	0.474	0.474	1	A
4,4'-DDE	ND		ug/kg	0.474	0.474	1	A
Dieldrin	ND		ug/kg	0.474	0.474	1	A
Endrin	ND		ug/kg	0.474	0.474	1	A
Endosulfan II	ND		ug/kg	0.474	0.474	1	A
4,4'-DDD	ND		ug/kg	0.474	0.474	1	A
cis-Nonachlor	ND		ug/kg	0.474	0.474	1	A
4,4'-DDT	ND		ug/kg	0.474	0.474	1	A
Methoxychlor	ND		ug/kg	1.90	1.90	1	A
Toxaphene	ND		ug/kg	23.8	23.8	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	101		30-150	B
BZ 198	85		30-150	B
DBOB	106		30-150	A
BZ 198	83		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-38
 Client ID: B567S05NVC
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 19:37
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.902	0.902	1	A
gamma-BHC	ND		ug/kg	0.451	0.451	1	A
Heptachlor	ND		ug/kg	0.451	0.451	1	A
Aldrin	ND		ug/kg	0.451	0.451	1	A
Heptachlor epoxide	ND		ug/kg	0.902	0.902	1	B
Oxychlorane	ND		ug/kg	0.902	0.902	1	B
trans-Chlordane	ND		ug/kg	0.451	0.451	1	A
Endosulfan I	ND		ug/kg	0.451	0.451	1	A
cis-Chlordane	ND		ug/kg	0.451	0.451	1	A
trans-Nonachlor	ND		ug/kg	0.451	0.451	1	B
4,4'-DDE	ND		ug/kg	0.451	0.451	1	A
Dieldrin	ND		ug/kg	0.451	0.451	1	A
Endrin	ND		ug/kg	0.451	0.451	1	A
Endosulfan II	ND		ug/kg	0.451	0.451	1	A
4,4'-DDD	ND		ug/kg	0.451	0.451	1	A
cis-Nonachlor	ND		ug/kg	0.451	0.451	1	A
4,4'-DDT	ND		ug/kg	0.451	0.451	1	A
Methoxychlor	ND		ug/kg	1.80	1.80	1	A
Toxaphene	ND		ug/kg	22.6	22.6	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	81		30-150	B
BZ 198	82		30-150	B
DBOB	70		30-150	A
BZ 198	76		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-39
 Client ID: B567S05NVD
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 20:10
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.921	0.921	1	A
gamma-BHC	ND		ug/kg	0.460	0.460	1	A
Heptachlor	ND		ug/kg	0.460	0.460	1	A
Aldrin	ND		ug/kg	0.460	0.460	1	A
Heptachlor epoxide	ND		ug/kg	0.921	0.921	1	B
Oxychlordane	ND		ug/kg	0.921	0.921	1	B
trans-Chlordane	ND		ug/kg	0.460	0.460	1	A
Endosulfan I	ND		ug/kg	0.460	0.460	1	A
cis-Chlordane	ND		ug/kg	0.460	0.460	1	A
trans-Nonachlor	ND		ug/kg	0.460	0.460	1	B
4,4'-DDE	ND		ug/kg	0.460	0.460	1	A
Dieldrin	ND		ug/kg	0.460	0.460	1	A
Endrin	ND		ug/kg	0.460	0.460	1	A
Endosulfan II	ND		ug/kg	0.460	0.460	1	A
4,4'-DDD	ND		ug/kg	0.460	0.460	1	A
cis-Nonachlor	ND		ug/kg	0.460	0.460	1	A
4,4'-DDT	ND		ug/kg	0.460	0.460	1	A
Methoxychlor	ND		ug/kg	1.84	1.84	1	A
Toxaphene	ND		ug/kg	23.1	23.1	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	93		30-150	B
BZ 198	85		30-150	B
DBOB	90		30-150	A
BZ 198	83		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-40
 Client ID: B567S05NVE
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Nereis
 Analytical Method: 1,8081B
 Analytical Date: 01/16/19 20:44
 Analyst: DP
 Percent Solids: Results reported on an 'AS RECEIVED' basis.

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 12:13
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
RIM Organochlorine Pesticides - Mansfield Lab							
Hexachlorobenzene	ND		ug/kg	0.933	0.933	1	A
gamma-BHC	ND		ug/kg	0.466	0.466	1	A
Heptachlor	ND		ug/kg	0.466	0.466	1	A
Aldrin	ND		ug/kg	0.466	0.466	1	A
Heptachlor epoxide	ND		ug/kg	0.933	0.933	1	B
Oxychlordane	ND		ug/kg	0.933	0.933	1	B
trans-Chlordane	ND		ug/kg	0.466	0.466	1	A
Endosulfan I	ND		ug/kg	0.466	0.466	1	A
cis-Chlordane	ND		ug/kg	0.466	0.466	1	A
trans-Nonachlor	ND		ug/kg	0.466	0.466	1	B
4,4'-DDE	ND		ug/kg	0.466	0.466	1	A
Dieldrin	ND		ug/kg	0.466	0.466	1	A
Endrin	ND		ug/kg	0.466	0.466	1	A
Endosulfan II	ND		ug/kg	0.466	0.466	1	A
4,4'-DDD	ND		ug/kg	0.466	0.466	1	A
cis-Nonachlor	ND		ug/kg	0.466	0.466	1	A
4,4'-DDT	ND		ug/kg	0.466	0.466	1	A
Methoxychlor	ND		ug/kg	1.86	1.86	1	A
Toxaphene	ND		ug/kg	23.4	23.4	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DBOB	91		30-150	B
BZ 198	81		30-150	B
DBOB	87		30-150	A
BZ 198	79		30-150	A

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 01/15/19 17:22
Analyst: DP

Extraction Method: EPA 3570
Extraction Date: 01/04/19 09:34
Cleanup Method: EPA 3630
Cleanup Date: 01/05/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1194728-1						
Hexachlorobenzene	ND		ug/kg	1.00	1.00	A
gamma-BHC	ND		ug/kg	0.500	0.500	A
Heptachlor	ND		ug/kg	0.500	0.500	A
Aldrin	ND		ug/kg	0.500	0.500	A
trans-Chlordane	ND		ug/kg	0.500	0.500	A
Endosulfan I	ND		ug/kg	0.500	0.500	A
cis-Chlordane	ND		ug/kg	0.500	0.500	A
trans-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDE	ND		ug/kg	0.500	0.500	A
Dieldrin	ND		ug/kg	0.500	0.500	A
Endrin	ND		ug/kg	0.500	0.500	A
Endosulfan II	ND		ug/kg	0.500	0.500	A
4,4'-DDD	ND		ug/kg	0.500	0.500	A
cis-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDT	ND		ug/kg	0.500	0.500	A
Methoxychlor	ND		ug/kg	2.00	2.00	A
Toxaphene	ND		ug/kg	25.1	25.1	A
Heptachlor epoxide	ND		ug/kg	1.00	1.00	B
Oxychlordane	ND		ug/kg	1.00	1.00	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	79		30-150	B
BZ 198	82		30-150	B
DBOB	86		30-150	A
BZ 198	79		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
 Analytical Date: 01/15/19 17:44
 Analyst: DP

Extraction Method: EPA 3570
 Extraction Date: 01/04/19 09:35
 Cleanup Method: EPA 3630
 Cleanup Date: 01/06/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
RIM Organochlorine Pesticides - Mansfield Lab for sample(s): 21-40 Batch: WG1194732-1						
Hexachlorobenzene	ND		ug/kg	1.00	1.00	A
gamma-BHC	ND		ug/kg	0.500	0.500	A
Heptachlor	ND		ug/kg	0.500	0.500	A
Aldrin	ND		ug/kg	0.500	0.500	A
trans-Chlordane	ND		ug/kg	0.500	0.500	A
Endosulfan I	ND		ug/kg	0.500	0.500	A
cis-Chlordane	ND		ug/kg	0.500	0.500	A
trans-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDE	ND		ug/kg	0.500	0.500	A
Dieldrin	ND		ug/kg	0.500	0.500	A
Endrin	ND		ug/kg	0.500	0.500	A
Endosulfan II	ND		ug/kg	0.500	0.500	A
4,4'-DDD	ND		ug/kg	0.500	0.500	A
cis-Nonachlor	ND		ug/kg	0.500	0.500	A
4,4'-DDT	ND		ug/kg	0.500	0.500	A
Methoxychlor	ND		ug/kg	2.00	2.00	A
Toxaphene	ND		ug/kg	25.1	25.1	A
Heptachlor epoxide	ND		ug/kg	1.00	1.00	B
Oxychlordane	ND		ug/kg	1.00	1.00	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	67		30-150	B
BZ 198	67		30-150	B
DBOB	61		30-150	A
BZ 198	66		30-150	A



Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194728-2 WG1194728-3									
Hexachlorobenzene	86		86		50-120	0		30	A
gamma-BHC	70		82		50-120	16		30	A
Heptachlor	78		82		50-120	5		30	A
Aldrin	82		85		50-120	4		30	A
trans-Chlordane	81		87		50-120	7		30	A
Endosulfan I	62		85		50-120	31	Q	30	A
cis-Chlordane	79		85		50-120	7		30	A
trans-Nonachlor	78		82		50-120	5		30	A
4,4'-DDE	93		97		50-120	4		30	A
Dieldrin	69		93		50-120	30		30	A
Endrin	56		84		50-120	40	Q	30	A
4,4'-DDD	73		82		50-120	12		30	A
cis-Nonachlor	83		90		50-120	8		30	A
4,4'-DDT	74		85		50-120	14		30	A
Methoxychlor	17	Q	70		50-120	122	Q	30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	85		80		30-150	B
BZ 198	83		85		30-150	B
DBOB	84		86		30-150	A
BZ 198	83		81		30-150	A



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 Batch: WG1194728-2 WG1194728-3									
Heptachlor epoxide	63		79		50-120	23		30	B
Oxychlorane	76		82		50-120	8		30	B
Endosulfan II	45	Q	77		50-120	52	Q	30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DBOB	85		80		30-150	B
BZ 198	83		85		30-150	B
DBOB	84		86		30-150	A
BZ 198	83		81		30-150	A

Lab Control Sample Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits	Column
	%Recovery	Qual	%Recovery	Qual					
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194732-2 WG1194732-3									
Hexachlorobenzene	81		83		50-120	2		30	A
gamma-BHC	74		77		50-120	4		30	A
Heptachlor	79		82		50-120	4		30	A
Aldrin	87		88		50-120	1		30	A
trans-Chlordane	85		87		50-120	2		30	A
Endosulfan I	80		80		50-120	0		30	A
cis-Chlordane	86		88		50-120	2		30	A
trans-Nonachlor	80		82		50-120	2		30	A
4,4'-DDE	99		97		50-120	2		30	A
Dieldrin	92		94		50-120	2		30	A
Endrin	78		82		50-120	5		30	A
4,4'-DDD	85		85		50-120	0		30	A
cis-Nonachlor	87		88		50-120	1		30	A
4,4'-DDT	93		92		50-120	1		30	A
Methoxychlor	82		80		50-120	2		30	A

Surrogate	LCS		LCSD		Acceptance Criteria	Column
	%Recovery	Qual	%Recovery	Qual		
DBOB	85		89		30-150	B
BZ 198	87		85		30-150	B
DBOB	74		76		30-150	A
BZ 198	84		83		30-150	A



Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits	Column
	%Recovery	Qual	%Recovery	Qual					
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 Batch: WG1194732-2 WG1194732-3									
Heptachlor epoxide	86		89		50-120	3		30	B
Oxychlorane	86		88		50-120	2		30	B
Endosulfan II	81		85		50-120	5		30	B

Surrogate	LCS		LCSD		Acceptance Criteria	Column
	%Recovery	Qual	%Recovery	Qual		
DBOB	85		89		30-150	B
BZ 198	87		85		30-150	B
DBOB	74		76		30-150	A
BZ 198	84		83		30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>	<i>Column</i>
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194728-4 WG1194728-5 QC Sample: L1853059-01 Client ID: B567PRENVA													
Hexachlorobenzene	ND	97.8	77.7	79		72.5	73		50-120	7		30	A
gamma-BHC	ND	97.8	76.5	78		72.7	73		50-120	5		30	A
Heptachlor	ND	97.8	77.2	79		72.4	73		50-120	6		30	A
Aldrin	ND	97.8	79.2	81		74.4	75		50-120	6		30	A
Heptachlor epoxide	ND	97.8	66.0	68		67.6	68		50-120	2		30	B
Oxychlorane	ND	97.8	72.4	74		73.2	74		50-120	1		30	B
trans-Chlordane	ND	97.8	84.6	87		79.9	81		50-120	6		30	A
Endosulfan I	ND	97.8	80.9	83		76.3	77		50-120	6		30	A
cis-Chlordane	ND	97.8	89.9P	92		80.0	81		50-120	12		30	A
trans-Nonachlor	ND	97.8	62.6	64		63.5	64		50-120	1		30	B
4,4'-DDE	ND	97.8	87.7	90		82.4	83		50-120	6		30	A
Dieldrin	ND	97.8	85.4	87		80.2	81		50-120	6		30	A
Endrin	ND	97.8	76.3	78		72.5	73		50-120	5		30	A
Endosulfan II	ND	97.8	70.6	72		72.7	73		50-120	3		30	B
4,4'-DDD	ND	97.8	75.2	77		71.5	72		50-120	5		30	A
cis-Nonachlor	ND	97.8	77.5	79		72.9	74		50-120	6		30	A
4,4'-DDT	ND	97.8	91.1	93		80.1	81		50-120	13		30	A
Methoxychlor	ND	97.8	72.3	74		70.1	71		50-120	3		30	A

<i>Surrogate</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>	<i>Column</i>
BZ 198	78		87		30-150	B
DBOB	73		74		30-150	B

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194728-4 WG1194728-5 QC Sample: L1853059-01 Client ID: B567PRENVA

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
BZ 198	73		71		30-150	A
DBOB	120		106		30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>	<i>Column</i>
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194732-4 WG1194732-5 QC Sample: L1853059-21 Client ID: B567S02NVA													
Hexachlorobenzene	ND	99.2	80.5	81		83.1	93		50-120	3		30	A
gamma-BHC	ND	99.2	79.7	80		78.5	88		50-120	2		30	A
Heptachlor	ND	99.2	76.1	77		77.0	87		50-120	1		30	A
Aldrin	ND	99.2	80.2	81		78.0	88		50-120	3		30	A
Heptachlor epoxide	ND	99.2	67.5	68		67.2	76		50-120	0		30	B
Oxychlordane	ND	99.2	65.8	66		69.3	78		50-120	5		30	B
trans-Chlordane	0.494	99.2	74.2	74		78.0	87		50-120	5		30	B
Endosulfan I	ND	99.2	65.2	66		63.8	72		50-120	2		30	A
cis-Chlordane	ND	99.2	68.0	69		68.7	77		50-120	1		30	A
trans-Nonachlor	ND	99.2	62.6	63		63.6	72		50-120	2		30	B
4,4'-DDE	ND	99.2	70.4	71		66.3	75		50-120	6		30	B
Dieldrin	ND	99.2	73.3	74		69.8	79		50-120	5		30	A
Endrin	ND	99.2	74.3	75		69.4	78		50-120	7		30	A
Endosulfan II	ND	99.2	58.9	59		56.3	63		50-120	5		30	B
4,4'-DDD	ND	99.2	76.2	77		69.3	78		50-120	9		30	A
cis-Nonachlor	ND	99.2	68.9	70		65.0	73		50-120	6		30	A
4,4'-DDT	ND	99.2	65.5	66		53.1	60		50-120	21		30	A
Methoxychlor	ND	99.2	64.4	65		56.6	64		50-120	13		30	A

<i>Surrogate</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>	<i>Column</i>
BZ 198	88		96		30-150	B
DBOB	89		69		30-150	B

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194732-4 WG1194732-5 QC Sample: L1853059-21 Client ID: B567S02NVA												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
BZ 198	76		76		30-150	A
DBOB	82		66		30-150	A



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194728-6 QC Sample: L1853059-02 Client ID: B567PRENVB						
Hexachlorobenzene	ND	ND	ug/kg	NC		30 A
gamma-BHC	ND	ND	ug/kg	NC		30 A
Heptachlor	ND	ND	ug/kg	NC		30 A
Aldrin	ND	ND	ug/kg	NC		30 A
Heptachlor epoxide	ND	ND	ug/kg	NC		30 B
Oxychlordane	ND	ND	ug/kg	NC		30 B
trans-Chlordane	ND	ND	ug/kg	NC		30 A
Endosulfan I	ND	ND	ug/kg	NC		30 A
cis-Chlordane	ND	ND	ug/kg	NC		30 A
trans-Nonachlor	ND	ND	ug/kg	NC		30 B
4,4'-DDE	ND	ND	ug/kg	NC		30 A
Dieldrin	ND	ND	ug/kg	NC		30 A
Endrin	ND	ND	ug/kg	NC		30 A
Endosulfan II	ND	ND	ug/kg	NC		30 A
4,4'-DDD	ND	ND	ug/kg	NC		30 A
cis-Nonachlor	ND	ND	ug/kg	NC		30 A
4,4'-DDT	ND	ND	ug/kg	NC		30 A
Methoxychlor	ND	ND	ug/kg	NC		30 A
Toxaphene	ND	ND	ug/kg	NC		30 A

Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853059

Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194728-6 QC Sample: L1853059-02 Client ID: B567PRENVB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	74		77		30-150	B
BZ 198	84		88		30-150	B
DBOB	120		124		30-150	A
BZ 198	73		76		30-150	A



Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194732-6 QC Sample: L1853059-22 Client ID: B567S02NVB						
Hexachlorobenzene	ND	ND	ug/kg	NC		30 A
gamma-BHC	ND	ND	ug/kg	NC		30 A
Heptachlor	ND	ND	ug/kg	NC		30 A
Aldrin	ND	ND	ug/kg	NC		30 A
Heptachlor epoxide	ND	ND	ug/kg	NC		30 B
Oxychlordane	ND	ND	ug/kg	NC		30 B
Endosulfan I	ND	ND	ug/kg	NC		30 A
cis-Chlordane	ND	ND	ug/kg	NC		30 A
trans-Nonachlor	ND	ND	ug/kg	NC		30 B
4,4'-DDE	0.484P	ND	ug/kg	NC		30 A
Dieldrin	ND	ND	ug/kg	NC		30 A
Endrin	ND	ND	ug/kg	NC		30 A
Endosulfan II	ND	ND	ug/kg	NC		30 A
4,4'-DDD	ND	ND	ug/kg	NC		30 A
cis-Nonachlor	ND	ND	ug/kg	NC		30 A
4,4'-DDT	ND	ND	ug/kg	NC		30 A
Methoxychlor	ND	ND	ug/kg	NC		30 A
Toxaphene	ND	ND	ug/kg	NC		30 A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
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Lab Duplicate Analysis
Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Project Number: 60588790 TASK 10.0

Lab Number: L1853059

Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM Organochlorine Pesticides - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1194732-6 QC Sample: L1853059-22 Client ID: B567S02NVB						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
DBOB	89		92		30-150	B
BZ 198	71		79		30-150	B
DBOB	75		76		30-150	A
BZ 198	67		74		30-150	A



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194728-7

Parameter	% Recovery	Qual	QC Criteria
cis-Chlordane	61		40-140
4,4'-DDE	72		40-140
4,4'-DDD	97		40-140
DBOB (Surrogate)	78		30-150
DBOB (Surrogate)	86		30-150
BZ 198 (Surrogate)	69		30-150
BZ 198 (Surrogate)	72		30-150

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1194732-7

Parameter	% Recovery	Qual	QC Criteria
cis-Chlordane	82		40-140
4,4'-DDE	64		40-140
4,4'-DDD	58		40-140
DBOB (Surrogate)	68		30-150
DBOB (Surrogate)	78		30-150
BZ 198 (Surrogate)	66		30-150
BZ 198 (Surrogate)	70		30-150

METALS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-01
 Client ID: B567PRENVA
 Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
 Date Received: 12/26/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Nereis
 Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.07		mg/kg	0.083	0.029	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.033	0.009	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Chromium, Total	0.297	J	mg/kg	0.333	0.030	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Copper, Total	1.11		mg/kg	0.083	0.028	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Lead, Total	0.254		mg/kg	0.033	0.005	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Mercury, Total	0.003	J	mg/kg	0.010	0.003	5	01/07/19 12:48	01/08/19 12:45	EPA 7474	1,7474	BV
Nickel, Total	0.291		mg/kg	0.083	0.031	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM
Zinc, Total	7.70		mg/kg	0.833	0.124	2	01/07/19 12:48	01/11/19 16:35	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-02

Date Collected: 12/20/18 09:00

Client ID: B567PRENVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.08		mg/kg	0.093	0.032	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.037	0.010	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Chromium, Total	0.288	J	mg/kg	0.374	0.034	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Copper, Total	1.18		mg/kg	0.093	0.031	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Lead, Total	0.264		mg/kg	0.037	0.005	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/07/19 12:48	01/08/19 12:53	EPA 7474	1,7474	BV
Nickel, Total	0.314		mg/kg	0.093	0.035	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM
Zinc, Total	7.75		mg/kg	0.934	0.139	2	01/07/19 12:48	01/11/19 17:02	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-03

Date Collected: 12/20/18 09:00

Client ID: B567PRENVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	2.03		mg/kg	0.093	0.032	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.037	0.010	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Chromium, Total	0.289	J	mg/kg	0.370	0.033	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Copper, Total	1.12		mg/kg	0.093	0.031	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Lead, Total	0.248		mg/kg	0.037	0.005	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/07/19 12:48	01/08/19 13:04	EPA 7474	1,7474	BV
Nickel, Total	0.307		mg/kg	0.093	0.034	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM
Zinc, Total	7.59		mg/kg	0.926	0.138	2	01/07/19 12:48	01/11/19 17:07	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-11

Date Collected: 12/20/18 09:30

Client ID: B567R01NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.56		mg/kg	0.089	0.030	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.035	0.009	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Chromium, Total	0.081	J	mg/kg	0.354	0.032	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Copper, Total	1.32		mg/kg	0.089	0.030	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Lead, Total	0.163		mg/kg	0.035	0.005	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:07	EPA 7474	1,7474	BV
Nickel, Total	0.138		mg/kg	0.089	0.033	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM
Zinc, Total	14.0		mg/kg	0.885	0.132	2	01/07/19 12:48	01/11/19 17:12	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-12

Date Collected: 12/20/18 09:30

Client ID: B567R01NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.49		mg/kg	0.091	0.031	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Cadmium, Total	0.033	J	mg/kg	0.036	0.010	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Chromium, Total	0.065	J	mg/kg	0.364	0.033	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Copper, Total	1.09		mg/kg	0.091	0.030	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Lead, Total	0.165		mg/kg	0.036	0.005	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:09	EPA 7474	1,7474	BV
Nickel, Total	0.118		mg/kg	0.091	0.034	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM
Zinc, Total	20.2		mg/kg	0.909	0.135	2	01/07/19 12:48	01/11/19 17:16	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-13

Date Collected: 12/20/18 09:30

Client ID: B567R01NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.31		mg/kg	0.099	0.034	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Cadmium, Total	0.026	J	mg/kg	0.040	0.010	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Chromium, Total	0.056	J	mg/kg	0.396	0.036	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Copper, Total	1.16		mg/kg	0.099	0.033	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Lead, Total	0.181		mg/kg	0.040	0.006	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.004	5	01/07/19 12:48	01/08/19 13:12	EPA 7474	1,7474	BV
Nickel, Total	0.114		mg/kg	0.099	0.037	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM
Zinc, Total	5.57		mg/kg	0.990	0.148	2	01/07/19 12:48	01/11/19 17:21	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-14

Date Collected: 12/20/18 09:30

Client ID: B567R01NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.50		mg/kg	0.084	0.029	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Cadmium, Total	0.027	J	mg/kg	0.034	0.009	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Chromium, Total	0.111	J	mg/kg	0.336	0.030	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Copper, Total	1.05		mg/kg	0.084	0.028	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Lead, Total	0.161		mg/kg	0.034	0.005	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:14	EPA 7474	1,7474	BV
Nickel, Total	0.144		mg/kg	0.084	0.031	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM
Zinc, Total	5.71		mg/kg	0.840	0.125	2	01/07/19 12:48	01/11/19 17:25	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-15

Date Collected: 12/20/18 09:30

Client ID: B567R01NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.65		mg/kg	0.088	0.030	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.035	0.009	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Chromium, Total	0.052	J	mg/kg	0.351	0.032	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Copper, Total	1.20		mg/kg	0.088	0.029	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Lead, Total	0.178		mg/kg	0.035	0.005	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:17	EPA 7474	1,7474	BV
Nickel, Total	0.096		mg/kg	0.088	0.033	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM
Zinc, Total	6.75		mg/kg	0.877	0.131	2	01/07/19 12:48	01/11/19 17:30	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-16

Date Collected: 12/20/18 09:45

Client ID: B567S01NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.16		mg/kg	0.093	0.032	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.037	0.010	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Chromium, Total	0.039	J	mg/kg	0.370	0.033	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Copper, Total	0.787		mg/kg	0.093	0.031	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Lead, Total	0.102		mg/kg	0.037	0.005	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.003	5	01/07/19 12:48	01/08/19 13:19	EPA 7474	1,7474	BV
Nickel, Total	0.074	J	mg/kg	0.093	0.034	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM
Zinc, Total	4.88		mg/kg	0.926	0.138	2	01/07/19 12:48	01/11/19 17:48	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-17

Date Collected: 12/20/18 09:45

Client ID: B567S01NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.40		mg/kg	0.090	0.031	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Cadmium, Total	0.032	J	mg/kg	0.036	0.009	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Chromium, Total	0.087	J	mg/kg	0.360	0.032	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Copper, Total	1.09		mg/kg	0.090	0.030	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Lead, Total	0.201		mg/kg	0.036	0.005	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:22	EPA 7474	1,7474	BV
Nickel, Total	0.102		mg/kg	0.090	0.034	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM
Zinc, Total	6.31		mg/kg	0.901	0.134	2	01/07/19 12:48	01/11/19 17:53	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-18

Date Collected: 12/20/18 09:45

Client ID: B567S01NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.57		mg/kg	0.086	0.029	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Cadmium, Total	0.029	J	mg/kg	0.034	0.009	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Chromium, Total	0.083	J	mg/kg	0.342	0.031	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Copper, Total	1.05		mg/kg	0.086	0.029	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Lead, Total	0.163		mg/kg	0.034	0.005	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:24	EPA 7474	1,7474	BV
Nickel, Total	0.140		mg/kg	0.086	0.032	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM
Zinc, Total	29.4		mg/kg	0.855	0.127	2	01/07/19 12:48	01/11/19 17:57	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-19

Date Collected: 12/20/18 09:45

Client ID: B567S01NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.01		mg/kg	0.098	0.034	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Cadmium, Total	0.027	J	mg/kg	0.039	0.010	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Chromium, Total	0.037	J	mg/kg	0.392	0.035	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Copper, Total	0.743		mg/kg	0.098	0.033	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Lead, Total	0.161		mg/kg	0.039	0.006	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.012	0.004	5	01/07/19 12:48	01/08/19 13:35	EPA 7474	1,7474	BV
Nickel, Total	0.088	J	mg/kg	0.098	0.037	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM
Zinc, Total	4.50		mg/kg	0.980	0.146	2	01/07/19 12:48	01/11/19 18:02	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-20

Date Collected: 12/20/18 09:45

Client ID: B567S01NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.21		mg/kg	0.085	0.029	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Cadmium, Total	0.029	J	mg/kg	0.034	0.009	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Chromium, Total	0.058	J	mg/kg	0.339	0.031	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Copper, Total	0.920		mg/kg	0.085	0.028	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Lead, Total	0.211		mg/kg	0.034	0.005	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:37	EPA 7474	1,7474	BV
Nickel, Total	0.107		mg/kg	0.085	0.032	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM
Zinc, Total	5.39		mg/kg	0.847	0.126	2	01/07/19 12:48	01/11/19 18:07	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-21

Date Collected: 12/20/18 10:00

Client ID: B567S02NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.62		mg/kg	0.088	0.030	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Cadmium, Total	0.041		mg/kg	0.035	0.009	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Chromium, Total	0.047	J	mg/kg	0.351	0.032	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Copper, Total	1.06		mg/kg	0.088	0.029	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Lead, Total	0.302		mg/kg	0.035	0.005	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:05	EPA 7474	1,7474	BV
Nickel, Total	0.103		mg/kg	0.088	0.033	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM
Zinc, Total	7.09		mg/kg	0.877	0.131	2	01/07/19 16:24	01/11/19 14:48	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-22

Date Collected: 12/20/18 10:00

Client ID: B567S02NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.38		mg/kg	0.089	0.030	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Cadmium, Total	0.037		mg/kg	0.035	0.009	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Chromium, Total	0.074	J	mg/kg	0.354	0.032	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Copper, Total	0.928		mg/kg	0.089	0.030	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Lead, Total	0.199		mg/kg	0.035	0.005	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:12	EPA 7474	1,7474	BV
Nickel, Total	0.127		mg/kg	0.089	0.033	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM
Zinc, Total	5.88		mg/kg	0.885	0.132	2	01/07/19 16:24	01/11/19 15:09	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-23

Date Collected: 12/20/18 10:00

Client ID: B567S02NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.47		mg/kg	0.093	0.032	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Cadmium, Total	0.019	J	mg/kg	0.037	0.010	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Chromium, Total	0.075	J	mg/kg	0.374	0.034	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Copper, Total	0.978		mg/kg	0.093	0.031	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Lead, Total	0.109		mg/kg	0.037	0.005	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.012	0.003	5	01/07/19 16:24	01/08/19 14:17	EPA 7474	1,7474	BV
Nickel, Total	0.105		mg/kg	0.093	0.035	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM
Zinc, Total	6.05		mg/kg	0.934	0.139	2	01/07/19 17:21	01/11/19 15:13	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-24

Date Collected: 12/20/18 10:00

Client ID: B567S02NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.52		mg/kg	0.090	0.031	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Cadmium, Total	0.027	J	mg/kg	0.036	0.009	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Chromium, Total	0.067	J	mg/kg	0.360	0.032	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Copper, Total	1.27		mg/kg	0.090	0.030	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Lead, Total	0.191		mg/kg	0.036	0.005	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Mercury, Total	0.006	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:20	EPA 7474	1,7474	BV
Nickel, Total	0.105		mg/kg	0.090	0.034	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM
Zinc, Total	7.49		mg/kg	0.901	0.134	2	01/07/19 17:21	01/11/19 15:17	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-25

Date Collected: 12/20/18 10:00

Client ID: B567S02NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.46		mg/kg	0.086	0.029	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.034	0.009	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Chromium, Total	0.094	J	mg/kg	0.342	0.031	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Copper, Total	1.10		mg/kg	0.086	0.029	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Lead, Total	0.159		mg/kg	0.034	0.005	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Mercury, Total	0.007	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:22	EPA 7474	1,7474	BV
Nickel, Total	0.120		mg/kg	0.086	0.032	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM
Zinc, Total	6.75		mg/kg	0.855	0.127	2	01/07/19 17:21	01/11/19 15:34	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-26

Date Collected: 12/20/18 10:15

Client ID: B567S03NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.08		mg/kg	0.091	0.031	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Cadmium, Total	0.024	J	mg/kg	0.036	0.010	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Chromium, Total	0.042	J	mg/kg	0.364	0.033	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Copper, Total	0.790		mg/kg	0.091	0.030	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Lead, Total	0.120		mg/kg	0.036	0.005	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Mercury, Total	ND		mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:25	EPA 7474	1,7474	BV
Nickel, Total	0.096		mg/kg	0.091	0.034	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM
Zinc, Total	4.70		mg/kg	0.909	0.135	2	01/07/19 17:21	01/11/19 15:38	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-27

Date Collected: 12/20/18 10:15

Client ID: B567S03NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.56		mg/kg	0.093	0.032	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Cadmium, Total	0.032	J	mg/kg	0.037	0.010	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Chromium, Total	0.063	J	mg/kg	0.374	0.034	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Copper, Total	1.30		mg/kg	0.093	0.031	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Lead, Total	0.185		mg/kg	0.037	0.005	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Mercury, Total	0.006	J	mg/kg	0.012	0.003	5	01/07/19 16:24	01/08/19 14:33	EPA 7474	1,7474	BV
Nickel, Total	0.137		mg/kg	0.093	0.035	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM
Zinc, Total	22.3		mg/kg	0.934	0.139	2	01/07/19 17:21	01/11/19 15:42	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-28

Date Collected: 12/20/18 10:15

Client ID: B567S03NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.64		mg/kg	0.093	0.032	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Cadmium, Total	0.028	J	mg/kg	0.037	0.010	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Chromium, Total	0.075	J	mg/kg	0.374	0.034	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Copper, Total	1.22		mg/kg	0.093	0.031	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Lead, Total	0.142		mg/kg	0.037	0.005	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.012	0.003	5	01/07/19 16:24	01/08/19 14:36	EPA 7474	1,7474	BV
Nickel, Total	0.164		mg/kg	0.093	0.035	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM
Zinc, Total	7.23		mg/kg	0.934	0.139	2	01/07/19 17:21	01/11/19 15:46	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-29

Date Collected: 12/20/18 10:15

Client ID: B567S03NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.47		mg/kg	0.083	0.028	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Cadmium, Total	0.026	J	mg/kg	0.033	0.009	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Chromium, Total	0.080	J	mg/kg	0.330	0.030	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Copper, Total	1.30		mg/kg	0.083	0.028	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Lead, Total	0.204		mg/kg	0.033	0.005	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.010	0.003	5	01/07/19 16:24	01/08/19 14:38	EPA 7474	1,7474	BV
Nickel, Total	0.154		mg/kg	0.083	0.031	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM
Zinc, Total	6.96		mg/kg	0.826	0.123	2	01/07/19 17:21	01/11/19 15:50	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-30

Date Collected: 12/20/18 10:15

Client ID: B567S03NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.48		mg/kg	0.090	0.031	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Cadmium, Total	0.031	J	mg/kg	0.036	0.009	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Chromium, Total	0.057	J	mg/kg	0.360	0.032	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Copper, Total	1.11		mg/kg	0.090	0.030	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Lead, Total	0.196		mg/kg	0.036	0.005	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:41	EPA 7474	1,7474	BV
Nickel, Total	0.109		mg/kg	0.090	0.034	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM
Zinc, Total	12.3		mg/kg	0.901	0.134	2	01/07/19 17:21	01/11/19 15:54	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-31

Date Collected: 12/20/18 10:30

Client ID: B567S04NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.61		mg/kg	0.099	0.034	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Cadmium, Total	0.023	J	mg/kg	0.040	0.010	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Chromium, Total	0.083	J	mg/kg	0.396	0.036	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Copper, Total	1.14		mg/kg	0.099	0.033	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Lead, Total	0.130		mg/kg	0.040	0.006	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.012	0.004	5	01/07/19 16:24	01/08/19 14:43	EPA 7474	1,7474	BV
Nickel, Total	0.142		mg/kg	0.099	0.037	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM
Zinc, Total	7.24		mg/kg	0.990	0.148	2	01/07/19 17:21	01/11/19 15:59	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-32

Date Collected: 12/20/18 10:30

Client ID: B567S04NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.51		mg/kg	0.086	0.030	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Cadmium, Total	0.022	J	mg/kg	0.035	0.009	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Chromium, Total	0.097	J	mg/kg	0.345	0.031	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Copper, Total	1.22		mg/kg	0.086	0.029	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Lead, Total	0.133		mg/kg	0.035	0.005	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:46	EPA 7474	1,7474	BV
Nickel, Total	0.126		mg/kg	0.086	0.032	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM
Zinc, Total	6.74		mg/kg	0.862	0.128	2	01/07/19 17:21	01/11/19 16:03	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-33

Date Collected: 12/20/18 10:30

Client ID: B567S04NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.10		mg/kg	0.087	0.030	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Cadmium, Total	0.019	J	mg/kg	0.035	0.009	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Chromium, Total	0.050	J	mg/kg	0.348	0.031	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Copper, Total	0.928		mg/kg	0.087	0.029	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Lead, Total	0.137		mg/kg	0.035	0.005	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Mercury, Total	0.004	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:53	EPA 7474	1,7474	BV
Nickel, Total	0.076	J	mg/kg	0.087	0.032	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM
Zinc, Total	26.9		mg/kg	0.870	0.130	2	01/07/19 17:21	01/11/19 16:07	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-34

Date Collected: 12/20/18 10:30

Client ID: B567S04NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.46		mg/kg	0.089	0.031	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Cadmium, Total	0.020	J	mg/kg	0.036	0.009	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Chromium, Total	0.076	J	mg/kg	0.357	0.032	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Copper, Total	1.14		mg/kg	0.089	0.030	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Lead, Total	0.120		mg/kg	0.036	0.005	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Mercury, Total	0.006	J	mg/kg	0.011	0.003	5	01/07/19 16:24	01/08/19 14:56	EPA 7474	1,7474	BV
Nickel, Total	0.118		mg/kg	0.089	0.033	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM
Zinc, Total	6.47		mg/kg	0.893	0.133	2	01/07/19 17:21	01/11/19 16:32	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-35

Date Collected: 12/20/18 10:30

Client ID: B567S04NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.52		mg/kg	0.086	0.030	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Cadmium, Total	0.025	J	mg/kg	0.035	0.009	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Chromium, Total	0.081	J	mg/kg	0.345	0.031	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Copper, Total	1.17		mg/kg	0.086	0.029	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Lead, Total	0.146		mg/kg	0.035	0.005	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Mercury, Total	0.010	J	mg/kg	0.011	0.003	5	01/07/19 18:18	01/08/19 14:58	EPA 7474	1,7474	BV
Nickel, Total	0.123		mg/kg	0.086	0.032	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM
Zinc, Total	20.7		mg/kg	0.862	0.128	2	01/07/19 18:18	01/11/19 16:36	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-36

Date Collected: 12/20/18 10:45

Client ID: B567S05NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.70		mg/kg	0.095	0.033	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Cadmium, Total	0.030	J	mg/kg	0.038	0.010	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Chromium, Total	0.072	J	mg/kg	0.381	0.034	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Copper, Total	1.73		mg/kg	0.095	0.032	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Lead, Total	0.186		mg/kg	0.038	0.006	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Mercury, Total	0.010	J	mg/kg	0.012	0.003	5	01/07/19 18:18	01/08/19 15:01	EPA 7474	1,7474	BV
Nickel, Total	0.245		mg/kg	0.095	0.035	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM
Zinc, Total	8.07		mg/kg	0.952	0.142	2	01/07/19 18:18	01/11/19 16:40	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-37

Date Collected: 12/20/18 10:45

Client ID: B567S05NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.58		mg/kg	0.086	0.029	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Cadmium, Total	0.026	J	mg/kg	0.034	0.009	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Chromium, Total	0.073	J	mg/kg	0.342	0.031	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Copper, Total	1.49		mg/kg	0.086	0.029	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Lead, Total	0.160		mg/kg	0.034	0.005	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.011	0.003	5	01/07/19 18:18	01/08/19 15:03	EPA 7474	1,7474	BV
Nickel, Total	0.145		mg/kg	0.086	0.032	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM
Zinc, Total	7.97		mg/kg	0.855	0.127	2	01/07/19 18:18	01/11/19 16:44	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-38

Date Collected: 12/20/18 10:45

Client ID: B567S05NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.35		mg/kg	0.085	0.029	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Cadmium, Total	0.021	J	mg/kg	0.034	0.009	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Chromium, Total	0.075	J	mg/kg	0.339	0.031	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Copper, Total	1.18		mg/kg	0.085	0.028	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Lead, Total	0.099		mg/kg	0.034	0.005	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Mercury, Total	0.009	J	mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:40	EPA 7474	1,7474	BV
Nickel, Total	0.117		mg/kg	0.085	0.032	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM
Zinc, Total	32.6		mg/kg	0.847	0.126	2	01/07/19 12:48	01/11/19 18:11	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-39

Date Collected: 12/20/18 10:45

Client ID: B567S05NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.62		mg/kg	0.089	0.030	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Cadmium, Total	0.025	J	mg/kg	0.035	0.009	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Chromium, Total	0.090	J	mg/kg	0.354	0.032	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Copper, Total	1.28		mg/kg	0.089	0.030	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Lead, Total	0.151		mg/kg	0.035	0.005	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Mercury, Total	0.010	J	mg/kg	0.011	0.003	5	01/07/19 12:48	01/08/19 13:42	EPA 7474	1,7474	BV
Nickel, Total	0.125		mg/kg	0.089	0.033	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM
Zinc, Total	6.93		mg/kg	0.885	0.132	2	01/07/19 12:48	01/11/19 19:02	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-40

Date Collected: 12/20/18 10:45

Client ID: B567S05NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	1.46		mg/kg	0.093	0.032	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Cadmium, Total	0.020	J	mg/kg	0.037	0.010	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Chromium, Total	0.087	J	mg/kg	0.370	0.033	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Copper, Total	1.28		mg/kg	0.093	0.031	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Lead, Total	0.143		mg/kg	0.037	0.005	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Mercury, Total	0.008	J	mg/kg	0.012	0.003	5	01/07/19 12:48	01/08/19 13:45	EPA 7474	1,7474	BV
Nickel, Total	0.128		mg/kg	0.093	0.034	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM
Zinc, Total	15.0		mg/kg	0.926	0.138	2	01/07/19 12:48	01/11/19 19:06	EPA 3051A	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03,11-20,38-40 Batch: WG1195377-1									
Arsenic, Total	ND	mg/kg	0.100	0.034	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Cadmium, Total	ND	mg/kg	0.040	0.011	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Chromium, Total	ND	mg/kg	0.400	0.036	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Copper, Total	ND	mg/kg	0.100	0.033	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Lead, Total	ND	mg/kg	0.040	0.006	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Nickel, Total	ND	mg/kg	0.100	0.037	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM
Zinc, Total	ND	mg/kg	1.00	0.149	2	01/07/19 14:05	01/11/19 15:58	1,6020B	AM

Prep Information

Digestion Method: EPA 3051A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03,11-20,38-40 Batch: WG1195379-1									
Mercury, Total	ND	mg/kg	0.013	0.004	5	01/07/19 12:18	01/08/19 12:38	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 21-37 Batch: WG1195380-1									
Arsenic, Total	ND	mg/kg	0.100	0.034	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Cadmium, Total	ND	mg/kg	0.040	0.011	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Chromium, Total	ND	mg/kg	0.400	0.036	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Copper, Total	ND	mg/kg	0.100	0.033	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Lead, Total	ND	mg/kg	0.040	0.006	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Nickel, Total	ND	mg/kg	0.100	0.037	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM
Zinc, Total	ND	mg/kg	1.00	0.149	2	01/07/19 16:24	01/11/19 13:57	1,6020B	AM



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3051A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 21-37 Batch: WG1195383-1									
Mercury, Total	ND	mg/kg	0.013	0.004	5	01/07/19 16:24	01/08/19 13:47	1,7474	BV

Prep Information

Digestion Method: EPA 7474

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 Batch: WG1195377-2								
Arsenic, Total	98		-		75-125	-		20
Cadmium, Total	99		-		75-125	-		20
Chromium, Total	92		-		75-125	-		20
Copper, Total	87		-		75-125	-		20
Lead, Total	103		-		75-125	-		20
Nickel, Total	91		-		75-125	-		20
Zinc, Total	94		-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 Batch: WG1195379-2 SRM Lot Number: HPHGAF								
Mercury, Total	110		-		80-120	-		20
Total Metals - Mansfield Lab Associated sample(s): 21-37 Batch: WG1195380-2								
Arsenic, Total	100		-		75-125	-		20
Cadmium, Total	101		-		75-125	-		20
Chromium, Total	94		-		75-125	-		20
Copper, Total	92		-		75-125	-		20
Lead, Total	100		-		75-125	-		20
Nickel, Total	95		-		75-125	-		20
Zinc, Total	97		-		75-125	-		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 21-37 Batch: WG1195383-2 SRM Lot Number: HPHGAF					
Mercury, Total	104	-	80-120	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 QC Batch ID: WG1195377-3 WG1195377-4 QC Sample: L1853059-01 Client ID: B567PRENVA												
Arsenic, Total	2.07	11	12.3	93		13.6	102		75-125	10		20
Cadmium, Total	0.030J	4.68	4.33	92		4.86	101		75-125	12		20
Chromium, Total	0.297J	18.3	15.7	86		17.8	94		75-125	13		20
Copper, Total	1.11	22.9	20.4	84		23.2	94		75-125	13		20
Lead, Total	0.254	46.8	45.0	96		51.0	105		75-125	13		20
Nickel, Total	0.291	45.9	39.8	86		44.6	94		75-125	11		20
Zinc, Total	7.70	45.9	53.6	100		54.9	100		75-125	2		20

Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 QC Batch ID: WG1195379-4 WG1195379-5 QC Sample: L1853059-01 Client ID: B567PRENVA

Mercury, Total	0.003J	0.584	0.589	101		0.609	105		80-120	3		20
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Total Metals - Mansfield Lab Associated sample(s): 21-37 QC Batch ID: WG1195380-3 WG1195380-4 QC Sample: L1853059-21 Client ID: B567S02NVA

Arsenic, Total	1.62	10.8	12.0	96		12.3	98		75-125	2		20
Cadmium, Total	0.041	4.59	4.68	101		4.55	97		75-125	3		20
Chromium, Total	0.047J	18	16.8	93		16.9	93		75-125	1		20
Copper, Total	1.06	22.5	21.8	92		21.6	90		75-125	1		20
Lead, Total	0.302	45.9	46.4	100		47.1	101		75-125	1		20
Nickel, Total	0.103	45	42.5	94		41.8	92		75-125	2		20
Zinc, Total	7.09	45	50.5	96		49.9	94		75-125	1		20

Total Metals - Mansfield Lab Associated sample(s): 21-37 QC Batch ID: WG1195383-3 WG1195383-4 QC Sample: L1853059-21 Client ID: B567S02NVA

Mercury, Total	ND	0.53	0.617	116		0.592	103		80-120	4		20
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Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 QC Batch ID: WG1195377-5 QC Sample: L1853059-02 Client ID: B567PRENVB						
Arsenic, Total	2.08	2.13	mg/kg	2		20
Cadmium, Total	0.030J	0.031J	mg/kg	NC		20
Chromium, Total	0.288J	0.293J	mg/kg	NC		20
Copper, Total	1.18	1.13	mg/kg	4		20
Lead, Total	0.264	0.257	mg/kg	3		20
Nickel, Total	0.314	0.312	mg/kg	1		20
Zinc, Total	7.75	10.1	mg/kg	26	Q	20
Total Metals - Mansfield Lab Associated sample(s): 01-03,11-20,38-40 QC Batch ID: WG1195379-6 QC Sample: L1853059-02 Client ID: B567PRENVB						
Mercury, Total	ND	ND	mg/kg	NC		20
Total Metals - Mansfield Lab Associated sample(s): 21-37 QC Batch ID: WG1195380-5 QC Sample: L1853059-22 Client ID: B567S02NVB						
Arsenic, Total	1.38	1.48	mg/kg	7		20
Cadmium, Total	0.037	0.035J	mg/kg	NC		20
Chromium, Total	0.074J	0.053J	mg/kg	NC		20
Copper, Total	0.928	0.991	mg/kg	7		20
Lead, Total	0.199	0.215	mg/kg	8		20
Nickel, Total	0.127	0.132	mg/kg	4		20
Zinc, Total	5.88	19.4	mg/kg	107	Q	20
Total Metals - Mansfield Lab Associated sample(s): 21-37 QC Batch ID: WG1195383-5 QC Sample: L1853059-22 Client ID: B567S02NVB						
Mercury, Total	ND	ND	mg/kg	NC		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1195377-6

Parameter	% Recovery	Qual	QC Criteria
Arsenic, Total	55	Q	65-139
Cadmium, Total	61	Q	67-135
Copper, Total	85		65-138
Lead, Total	99		56-155
Zinc, Total	54	Q	66-136

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1195379-3

Parameter	% Recovery	Qual	QC Criteria
Mercury, Total	69		41-183

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1195380-8

Parameter	% Recovery	Qual	QC Criteria
Arsenic, Total	68		65-139
Cadmium, Total	78		67-135
Copper, Total	97		65-138
Lead, Total	125		56-155
Zinc, Total	66		66-136

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1195383-6

Parameter	% Recovery	Qual	QC Criteria
Mercury, Total	91		41-183

INORGANICS & MISCELLANEOUS

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-01

Date Collected: 12/20/18 09:00

Client ID: B567PRENVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.683		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-02
Client ID: B567PRENVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.791		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-03
Client ID: B567PRENVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:00
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.891		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-11

Date Collected: 12/20/18 09:30

Client ID: B567R01NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.656		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-12
Client ID: B567R01NVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.790		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-13

Date Collected: 12/20/18 09:30

Client ID: B567R01NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.529		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-14
Client ID: B567R01NVD
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 09:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.758		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-15

Date Collected: 12/20/18 09:30

Client ID: B567R01NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.830		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-16

Date Collected: 12/20/18 09:45

Client ID: B567S01NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.657		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-17

Date Collected: 12/20/18 09:45

Client ID: B567S01NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.807		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-18

Date Collected: 12/20/18 09:45

Client ID: B567S01NVC

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.830		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-19

Date Collected: 12/20/18 09:45

Client ID: B567S01NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	91.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.519		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-20

Date Collected: 12/20/18 09:45

Client ID: B567S01NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	90.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.625		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-21

Date Collected: 12/20/18 10:00

Client ID: B567S02NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.646		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-22

Date Collected: 12/20/18 10:00

Client ID: B567S02NVB

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	89.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.736		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-23
Client ID: B567S02NVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:00
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.553		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-24

Date Collected: 12/20/18 10:00

Client ID: B567S02NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.676		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-25

Date Collected: 12/20/18 10:00

Client ID: B567S02NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.537		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-26
Client ID: B567S03NVA
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.716		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-27
Client ID: B567S03NVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.472		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-28
Client ID: B567S03NVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:15
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.851		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-29

Date Collected: 12/20/18 10:15

Client ID: B567S03NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.624		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-30

Date Collected: 12/20/18 10:15

Client ID: B567S03NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.922		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-31

Date Collected: 12/20/18 10:30

Client ID: B567S04NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.695		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-32
Client ID: B567S04NVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.597		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-33
Client ID: B567S04NVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	91.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.382		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-34

Date Collected: 12/20/18 10:30

Client ID: B567S04NVD

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	89.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.503		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-35
Client ID: B567S04NVE
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:30
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	88.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.681		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-36

Date Collected: 12/20/18 10:45

Client ID: B567S05NVA

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.688		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-37
Client ID: B567S05NVB
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.759		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-38
Client ID: B567S05NVC
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.758		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

SAMPLE RESULTS

Lab ID: L1853059-39
Client ID: B567S05NVD
Sample Location: NEW HAVEN, CT

Date Collected: 12/20/18 10:45
Date Received: 12/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	86.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.958		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**SAMPLE RESULTS**

Lab ID: L1853059-40

Date Collected: 12/20/18 10:45

Client ID: B567S05NVE

Date Received: 12/26/18

Sample Location: NEW HAVEN, CT

Field Prep: Not Specified

Sample Depth:

Matrix: Nereis

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	87.0		%	0.100	0.100	1	-	01/04/19 13:00	121,2540G	GD
Percent Lipids	0.821		%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Project Name: NEW HAVEN HARBOR SUPPLEMENT.

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab for sample(s): 01-03,11-20 Batch: WG1195192-1									
Percent Lipids	ND	%	0.100	NA	1	-	01/07/19 00:00	111,-	AL
General Chemistry - Mansfield Lab for sample(s): 21-40 Batch: WG1195205-1									
Percent Lipids	ND	%	0.100	NA	1	-	01/07/19 00:00	111,-	AL



Lab Duplicate Analysis

Batch Quality Control

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1194770-1 QC Sample: L1853059-02 Client ID: B567PRENVB						
Moisture	86.0	86.0	%	0		10
General Chemistry - Mansfield Lab Associated sample(s): 21-32 QC Batch ID: WG1194771-1 QC Sample: L1853059-22 Client ID: B567S02NVB						
Moisture	89.0	88.0	%	1		10
General Chemistry - Mansfield Lab Associated sample(s): 33-40 QC Batch ID: WG1194772-1 QC Sample: L1853059-33 Client ID: B567S04NVC						
Moisture	91.0	92.0	%	1		10
General Chemistry - Mansfield Lab Associated sample(s): 01-03,11-20 QC Batch ID: WG1195192-2 QC Sample: L1853059-02 Client ID: B567PRENVB						
Percent Lipids	0.791	0.791	%	0		20
General Chemistry - Mansfield Lab Associated sample(s): 21-40 QC Batch ID: WG1195205-2 QC Sample: L1853059-22 Client ID: B567S02NVB						
Percent Lipids	0.736	0.775	%	5		20

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-01A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-02A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-03A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-04A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-05A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL

Lab Number: L1853059

Project Number: 60588790 TASK 10.0

Report Date: 01/25/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-06A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-07A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-08A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-09A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-10A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-11A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-ARCHIVE(),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-12A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-13A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-14A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-15A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-16A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-17A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-18A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-19A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-20A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-21A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-22A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-23A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-24A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-25A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-26A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-27A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-28A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-29A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-30A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-31A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-32A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-33A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-34A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-35A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL**Lab Number:** L1853059**Project Number:** 60588790 TASK 10.0**Report Date:** 01/25/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1853059-36A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-37A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-38A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-39A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)
L1853059-40A	Glass 250ml/8oz unpreserved	B	NA		-6.7	Y	Absent		A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-HGPREP-AF(28),A2-PREP-3051(180),A2-CU-6020T(180),A2-RIM-PEST-8081(14)

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GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: NEW HAVEN HARBOR SUPPLEMENTAL
Project Number: 60588790 TASK 10.0

Lab Number: L1853059
Report Date: 01/25/19

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.
- 111 NOAA Technical Memorandum NOS ORCA 130: Sampling and Analytical Methods of the National Status and Trends Program Mussel Watch Project: 1993-196 Update. March 1998.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**
EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	No – see case narrative
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	No – see case narrative
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No – see case narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No – see case narrative
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes





Table II-1 (Continued): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	Yes
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	





Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No All within SOP criteria	CCV associated with L1853059-01 through -03, -11 through -20: Column B: cis-Nonachlor @ 19%, 4,4'-DDT @ 18%, Methoxychlor @ 17%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270D

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections ($\pm 15\%$ D)	No All within SOP limits	CCV associated with batch QC: C13-BZ#18 @ 16%, C14-BZ#52 @ 18% CCV associated with L1853059-01 through -03, 11 through -21: C14-BZ#52 @ 17% CCV associated with L1853059-22 through -40: C14-BZ#52 @ 16%	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	C13-BZ#28 @ 35%	In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	No	L1853059-01MS: C14-BZ#49 @ 49% L1853059-01MSD: C13-BZ#18 @ 193% %RPD: C13-BZ#18 @ 55%	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	L1853059-02D: C16-BZ#153 @ 32%, C17-BZ#180 @ 35%, C17-BZ#187 @ 39%	In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package



* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	No	Annually	Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥ 0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	WG1195377-6 As(55%), Cd(61%), Zn(54%)	In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	L1853059-02D: Zn (26%) L1853059-22D: Zn (107%)	In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift ($\pm 15\%$ D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.



Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)			In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor			In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.





Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	< 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	< 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.





EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No:

Serial_No:01251915:41

1853059

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250(NV)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalp	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	B567PreNvA	12/20/18	0900	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
002	B567PreNvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
003	B567PreNvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
004	B567PreNvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
005	B567PreNvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
006	B567LabNvA	12/20/18	0915	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
007	B567LabNvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
008	B567LabNvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
009	B567LabNvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
010	B567LabNvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
011	B567R01NvA	12/20/18	0930	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
012	B567R01NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C

Relinquished By:	Date: 12/26/18	Time: 1100	Received By:	Date: 12/26/18	Time: 1600
Relinquished By:	Date: 12/26/18	Time: 1320	Received at Lab By:	Date: 12/26/18	Time: 1320

Comments:

ERR

COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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EnviroSystems, Inc.
1 Lafayette Road
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Voice: 603-926-3345
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ESI Job No:

Serial_No:01251915:41

1853059

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250 (NV)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: PD816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filler N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
013	B567R01NvC	12/20/18	0930	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
014	B567R01NvD	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
015	B567R01NvE	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
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017	B567S01NvB	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
018	B567S01NvC	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
019	B567S01NvD	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
020	B567S01NvE	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
021	B567S02NvA	12/20/18	1000	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
022	B567S02NvB	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
023	B567S02NvC	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
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Relinquished By: T. Handall	Date: 12/26/18	Time: 1320	Received at Lab By:	Date: 12/26/18	Time: 1330

Comments:

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COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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EnviroSystems, Inc.
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ESI Job No:

Serial_No:01251915:41

L1853059

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250(NV)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
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034	B567S04NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
035	B567S04NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
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Comments:

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COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018 31250 (NW)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816 Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy.com ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (ml)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
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038	B567S05NvC	12/20/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
039	B567S05NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
040	B567S05NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids, TS%, PAH680, Pest8081, CGR680, Total Metals As, C
				ESI	C							
				ESI	C							
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				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							

Relinquished By: <i>[Signature]</i> Date: 12/26/18 Time: 1100	Received By: <i>T. Handley AAL</i> Date: 12/26/18 Time: 1100
Relinquished By: <i>T. Handley</i> Date: 12/26/18 Time: 1350	Received at Lab By: <i>[Signature]</i> Date: 12/26/18 Time: 1320

Comments: _____

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Appendix D: Biology Data

Appendix D.1: Suspended Particulate Phase Evaluation

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

January 14, 2019

SPP Final Report (Base and Ammonia-Reduced Tasks)

**TOXICOLOGICAL EVALUATION
OF A PROPOSED DREDGE SEDIMENT:**

**New Haven Harbor Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut**

**New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109**

Suspended Particulate Phase Evaluation

Prepared For:

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EnviroSystems, Inc. Master Reference 31242
Study Specific References 31248 / 31291
Report Issue Date: January 8, 2019
Assay Start: October 2018

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LABORATORY STANDARDS STATEMENT

This study was performed by EnviroSystems, an affiliate of Enthalpy Analytical LLC, at its facility in Hampton, New Hampshire. EnviroSystems' laboratory is accredited by the State of New Hampshire under the National Environmental Laboratory Accreditation (NELAC) program. Additionally, ESI is accredited under the Department of Defense (DoD) ELAP program, ISO/IEC 17025:2005, Certificate Number L2340. All testing conducted by EnviroSystems as part of this program was compliant with NELAC guidelines and standards. Additionally, this study was conducted in accordance with guidelines presented in the 2004 version of the New England District's *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal In New England Waters* (RIM) with relevant updates. Any deviations from specific elements of the RIM are detailed in the Protocol Deviation section of this report.



For EnviroSystems, Inc.

Kirk Cram
Laboratory Director

January 8, 2019

Date

TOXICOLOGICAL EVALUATION OF A PROPOSED DREDGE SEDIMENT:

New Haven Harbor 2018 Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut

New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109

Suspended Particulate Phase Evaluation

1.0 INTRODUCTION

As part of a comprehensive plan to reduce adverse environmental impacts of ocean dumping, Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 specifies that all sediments to be discharged into ocean waters must be evaluated to define their potential impact on existing benthic communities. The United States Environmental Protection Agency (US EPA) has determined that the most effective means to make such an assessment is through the use of bioassay tests, which provide a relatively direct estimate of potential impact.

This project was designed to evaluate the potential toxicity of sediments from the area of dredging proposed for the New Haven Harbor 2018 Federal Navigation Project (FNP) located in New Haven, Connecticut. Placement of dredge materials is proposed at the Central Long Island Sound Disposal Site (CLDS).

Testing involved conduct of Suspended Particulate Phase (SPP) assays using the mysid, *Americamysis bahia*, inland silverside minnow, *Menidia beryllina*, and larvae of the sea urchin, *Arbacia punctulata*. Testing followed procedures established by the US EPA and the US Army Corps of Engineers (US ACE) for testing of dredged material, including *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (US EPA, CENAE 2004), *Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual* (US EPA, US ACE 1991) and *Evaluation of Dredged Material Proposed for Discharge in Waters of the US - Testing Manual* (US EPA, US ACE 1998).

2.0 MATERIALS AND METHODS

2.1 Sample Collection, Preservation and Storage

Sediment cores for toxicological analysis were collected by the US ACE New England District (CENAE) using vibracoring equipment from locations identified in the dredge footprint specified in the project Work Plan (AECOM, 2018). Site water samples were also collected by the CENAE. Samples were received from AECOM, Chelmsford, Massachusetts under chain of custody in 3.5 gallon polyethylene buckets for sediment and in 5 gallon cubitainers for water. Sediment samples were composited based on the compositing scheme outlined in the Work Plan. Reference sediment and water samples were collected by the AECOM field team from the CLDS. Upon arrival at the laboratory, all samples received an internal sample control number and were logged into the project sample control system. Prior to testing, samples were placed in a secure refrigerator and stored at a temperature of $4 \pm 2^\circ\text{C}$ until test initiation. Sample identification, collection and receipt information is summarized in Table 1. Sample compositing information is provided in Table 2.

Water for the internal laboratory control is pumped in daily from the Hampton-Seabrook Estuary and stored in holding tanks. Seawater is obtained through a filter system located on the bottom of the

estuary at a point approximately 1 mile from the open ocean. The estuary receives no direct industrial discharges. Laboratory water is aerated through the collection system and in individual storage containers and test chambers. Water from the estuary has been used for the culture and maintenance of test organisms at ESI since 1978. The laboratory control (0%) was included to verify the health of the test organisms, and as a relative benchmark for reference site toxicity.

2.2 Sediment Preparation

Sediments were press sieved through a 2-mm stainless steel screen to remove large stones, sticks, roots, man-made material and indigenous organisms. Once sieved, a portion of each sample was used to initiate elutriate sample preparation for use in “unmitigated” assays. Unionized ammonia levels were determined in the undiluted “unmitigated” elutriate samples prior to test initiation. CENAE was notified that the unionized ammonia concentrations were greater than 0.1 mg/L and ESI was authorized to prepare additional elutriate samples from sediments treated to reduce ammonia levels and conduct additional SPP toxicity testing for all six composites.

The process for treating the sediments to reduce ammonia levels followed the Ferretti method (Ferretti et al, 2000), which involved loading a portion of each composite sediment sample into clean HDPE vessels to a depth of 7-11 mm and adding clean overlying water in a 1:3 ratio of sediment to water. A thin piece of plastic was placed over the sediment prior to adding the overlying water in an effort to keep the sediment from becoming suspended during the addition. The thin piece of plastic was slowly removed after the overlying water was added. Each mitigation vessel was aerated and the temperature, pH, specific conductivity, salinity and dissolved oxygen were recorded daily prior to siphoning off the overlying water.

A small sub-sample was removed daily from each sediment composite and centrifuged to extract pore water. Temperature, pH and salinity of the extract were recorded and the pore water was subsequently analyzed for total ammonia. These data were used to calculate the pore water unionized ammonia levels daily. When the daily value of any composite was below the target threshold of 0.1 mg/L unionized ammonia (AECOM, 2018), composites were removed from their mitigation vessels, placed in clean HDPE 1-gallon buckets and refrigerated prior to preparing elutriate solutions for use in “mitigated” assays. A summary of the pore water quality and ammonia data generated during the mitigation phase is provided in Table 3 and in Appendix A.

2.3 Elutriate Sample Preparation

Elutriate samples were prepared by placing one volume of test sediment and four volumes of overlying site water in a stainless steel container and mixing with a mechanical stirring blade, both made of inert materials, for 30 minutes. Speed of the stirring motor was set so that the sample did not cavitate, entrain air, and oxidize the sample, while at the same time keeping the sediment in suspension. After mixing, the sediment and water mixture was allowed to settle for an hour. The resulting supernatant solution was then removed by siphon and centrifuged for up to 20 minutes at 3,000 rpm for the SPP evaluation and at 5,000 rpm for chemical analysis. A summary of the elutriate preparation is provided in Table 4, and original elutriate preparation forms are provided in Appendix A.

Test concentrations were mixed by diluting the respective elutriate samples with overlying water collected from the CLDS reference site with one exception as described in Section 3.3.2, dilutions for an *A. punctulata* re-test were mixed using laboratory control seawater in lieu of CLDS reference water, which had exceeded its hold time. Test concentrations for all assays were 0% (laboratory control), 0% (CLDS reference water) except as noted for the *A. punctulata* re-test, 1%, 10%, 50% and 100% (undiluted) elutriate.

2.4 Test Species

A. bahia were ≤ 5 days old and were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. *M. beryllina* were 9-14 days old at the start of the assay and

were also obtained from ARO. Prior to use, test organisms were held for a minimum of 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. Organisms were transferred to test vessels using a large bore pipet to minimize the amount of water added to test solutions.

Adult *A. punctulata* were from cultures maintained by ESI, and original stock was obtained from ARO. Adult sea urchins are maintained in the laboratory for as long as they are viable. Male and female urchins are maintained in separate chambers at a temperature of approximately $12\pm 3^{\circ}\text{C}$ after spawning.

2.5 Suspended Particulate Phase Assays

Two sets of SPP assays were completed using the unmitigated and mitigated sediment prepared as described in Section 2.2, each with their own paired laboratory control and CLDS reference. The ammonia mitigated assays were run as a result of observed toxicity in the unmitigated studies, as determined by CENAE. Conduct of these assays, and implementation of the Ferretti method for ammonia mitigation in the sediments, is driven by the high probability that observed effects in the unmitigated studies are a function of test solution ammonia content. Other than the different sediment preparations, assay conduct for both the unmitigated and mitigated sediment was the same. In addition, the unmitigated assays were completed in two batches, each with their own paired laboratory control and CLDS reference with elutriate solutions 1, 2 and 6 included in the first batch and elutriate solutions 3, 4 and 5 included in the second batch. The mitigated assays were completed using all six elutriate solutions, one shared laboratory control and one shared CLDS reference for each species.

2.5.1 SPP Evaluations - *A. bahia* and *M. beryllina*

The 96 hour static acute toxicity tests were conducted at $20\pm 2^{\circ}\text{C}$ with a photoperiod of 16:8 hours light:dark. Test chambers were 250 mL beakers containing 200 mL of test solution in each of 5 replicates with 10 organisms/replicate. Survival in all test replicates was recorded after 1, 24, 48, 72, and 96 hours of exposure. Dissolved oxygen, pH, temperature and salinity were measured daily in one replicate of each treatment. *A. bahia* and *M. beryllina* were fed twice daily throughout testing. Salinity was checked daily and adjusted down as needed using de-ionized water.

2.5.2 Embryo Survival and Development SPP Evaluation - *A. punctulata*

The *A. punctulata* embryo survival and development assays were conducted at $20\pm 1^{\circ}\text{C}$ with a photoperiod of 16:8 hours light:dark. Test chambers for the acute assays were 250 mL glass beakers containing 200 mL test solution in each of 5 replicates. Dissolved oxygen, pH, temperature and salinity were measured in one replicate of each treatment at the start and end of the test. Gametes were obtained by potassium chloride injection to induce spawning. Gametes were collected and diluted with filtered laboratory seawater to yield approximate stock concentrations. Measured aliquots of gamete stock solutions were combined, fertilization success was monitored 15 minutes later, and the density of embryos was calculated. Sufficient embryos were removed from the stock solution and added to each test vessel to achieve a final concentration of approximately 20 to 30 embryos/mL of solution (US EPA Region 1, CENAE, 2004). Prior to transferring embryos from the holding vessel to the individual test vessels, the embryo stock solution was thoroughly homogenized to ensure even distribution. Embryo counts in three surrogate vessels were conducted just after the addition of the embryos for comparison with the actual embryo concentrations in the final elutriate solutions.

Observations in surrogate vessels were used to evaluate test completion. The test is terminated when approximately 90% of the fertilized embryos have reached the pluteus larval stage in the controls (between 48 and 96 hours). On termination, 5 mL aliquots of each test replicate were preserved with 10% buffered formalin solution. All larvae in the 5 mL aliquot were counted to determine survival and normal development. The period of assay conduct is presented in Table 5.

2.6 Data Analysis

Survival and development data were analyzed using CETIS™ (Comprehensive Environmental Toxicity Information System) v1.9.3.0 software to calculate the concentration that elicited a response in 50% of the test population, referred to as the median lethal concentration (LC-50) and/or effect concentration (EC-50). These point estimates were calculated using the non-parametric Spearman-Kärber method when a response was observed in 50% or more of the tested organisms. In situations where less than 50% of the tested population was affected, point estimates were calculated by linear interpolation.

2.7 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Summaries of reference toxicant assays conducted in support of this study are provided in Table 6.

3.0 RESULTS AND DISCUSSION

A summary of assay acceptability and laboratory control performance for the unmitigated and mitigated assays is provided in Tables 7 and 8, respectively, and calculated endpoints for each species are provided in Table 9. Water quality characteristics for the unmitigated and mitigated assays are summarized in Tables 10 and 11. Laboratory bench sheets, water quality data, and associated statistical support data are included in Appendix A.

3.1 SPP Evaluations - *A. bahia*

3.1.1 Unmitigated Sediment

At the end of the 96 hour exposure period, *A. bahia* survival was 100% in the laboratory control and 100% in the CLDS reference water treatment for both batches of unmitigated assays completed. These assays meet the minimum test acceptability criterion of $\geq 90\%$ survival in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Review of data generated at the end of the assays documented that the mysid LC-50s were $>100\%$ following exposure to elutriate solutions 1, 2, 4 and 6, however there were significant negative effects on mysid survival after exposure to elutriate solutions 3 and 5, which were prepared using unmitigated sediment. LC-50s for these elutriate solutions were 74% and 73%, respectively.

3.1.2 Mitigated Sediment

At the end of the 96 hour exposure period, *A. bahia* survival was 100% in the laboratory control and 100% in the CLDS reference water treatment. This assay meets the minimum test acceptability criterion of $\geq 90\%$ survival in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Review of data generated at the end of the assays documented that the mysid LC-50s were $>100\%$ for all the elutriate solutions prepared using mitigated sediments.

3.2 SPP Evaluations - *M. beryllina*

3.2.1 Unmitigated Sediment

The first batch of *M. beryllina* assays conducted using unmitigated sediment for elutriate solutions

1, 2 and 6 demonstrated poor performance in the laboratory control within 24 hours, therefore that assay was terminated and re-started using the same elutriate sample (within hold time) and lot of test organisms. The bench sheets for the terminated (failed) assay are included in Appendix A.

At the end of the 96 hour exposure period, *M. beryllina* survival was 96% in the laboratory control and 98% in the CLDS reference water treatment for the assays completed on elutriate solutions 1, 2 and 6. *M. beryllina* survival was 90% in the laboratory control and 98% in the CLDS reference water treatment for the assays completed on elutriate solutions 3, 4 and 5. These assays meet the minimum test acceptability criterion of $\geq 90\%$ survival in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Review of data generated at the end of the assays documented that there were significant negative effects on minnow survival from elutriate solutions 1, 2, 3, 4 and 5, which were prepared using unmitigated sediments. LC-50s for these elutriate solutions ranged from 56% to 69%. The minnow LC-50 was $>100\%$ for elutriate solution 6.

3.2.2 Mitigated Sediment

At the end of the 96 hour exposure period, *M. beryllina* survival was 90% in the laboratory control and 92% in the CLDS reference water treatment. This assay meets the minimum test acceptability criterion of $\geq 90\%$ survival in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Review of data generated at the end of the assays documented that the minnow LC-50s were $>100\%$ for all the elutriate solutions prepared using mitigated sediments.

3.3 SPP Evaluations - *A. punctulata*

3.3.1 Unmitigated Sediment

Counts made in the laboratory control surrogate test vessels at the initiation of the *A. punctulata* assay for elutriate solutions 1, 2 and 6 indicated an average initial embryo concentration of 121 embryos/5mL, equal to approximately 24 embryos/mL. The assay was terminated after 90 hours exposure when it was determined that the majority of the larvae ($>90\%$) in the surrogate chambers had reached the pluteus larval stage. Embryo counts in the laboratory control treatment showed 78% of the embryos survived at the end of the assay. Of the original embryos, 77% were normally developed pluteus larvae. This meets the minimum test acceptability criteria of $\geq 70\%$ embryo survival and $\geq 70\%$ normal development in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Counts made in the laboratory control surrogate test vessels at the initiation of the *A. punctulata* assay for elutriate solutions 3, 4 and 5 indicated an average initial embryo concentration of 132 embryos/5mL, equal to approximately 26 embryos/mL. The assay was terminated after 74 hours exposure when it was determined that the majority of the larvae ($>90\%$) in the surrogate chambers had reached the pluteus larval stage. Embryo counts in the laboratory control treatment showed 86% of the embryos survived at the end of the assay. Of the original embryos, 85% were normally developed pluteus larvae. This meets the minimum test acceptability criteria of $\geq 70\%$ embryo survival and $\geq 70\%$ normal development in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

Review of the data generated at the end of the assays indicate that all the elutriate solutions prepared using unmitigated sediment had significant negative impacts on urchin embryonic survival and/or development, with LC-50s and EC-50s based on Spearman-Kärber calculation ranging from 3-22% for both

survival and development.

3.3.2 Mitigated Sediment

The *A. punctulata* assay initiated on October 31, 2018 using the same elutriate sample as the *A. bahia* and *M. beryllina* assays failed to meet test acceptability in the laboratory control. A passing assay was initiated on November 21, 2018 using a different lot of test organisms and a second set of elutriate samples generated using a new site water sample because the original sample had exceeded its hold time. The dilutions for the SPP were mixed using laboratory control seawater in lieu of CLDS reference water, which had also exceeded its hold time. Refer to Appendix A for a copy of the email communication regarding use of laboratory water to mix the dilutions for this assay.

Counts made in the laboratory control surrogate test vessels at the initiation of the *A. punctulata* assay indicated an average initial embryo concentration of 105 embryos/5mL, equal to approximately 21 embryos/mL. The assay was terminated after 68 hours exposure when it was determined that the majority of the larvae (>90%) in the surrogate chambers had reached the pluteus larval stage. Embryo counts in the laboratory control treatment showed 76% of the embryos survived at the end of the assay. Of the original embryos, 74% were normally developed pluteus larvae. This meets the minimum test acceptability criteria of $\geq 70\%$ embryo survival and $\geq 70\%$ normal development in the laboratory control indicating that the test organisms were healthy and not stressed by handling. These data are considered valid for evaluating impacts associated with the elutriate samples.

The EC-50s for development and LC-50s for survival generated from the urchin assay data were >100% in all the elutriate solutions prepared using mitigated sediment.

3.4 Water Quality Data

3.4.1 Unmitigated Sediment

Temperature data collected during daily water quality observations documented values ranging from 14°C to 23°C, salinity levels ranging from 28 to 33‰ and dissolved oxygen levels ranging from 5.5 to 10.1 mg/L (Table 7). Test acceptability criteria requires a mean temperature of $20 \pm 2^\circ\text{C}$ ($20 \pm 1^\circ\text{C}$ for *A. punctulata*), salinity within a range of $30 \pm 2\text{‰}$ and dissolved oxygen of $\geq 40\%$ (approximately equal to 3.3 mg/L for assays maintained at 20°C, 30‰ and a barometric pressure of 760 inches Hg). Please see section 3.5 for a discussion of protocol deviations related to salinity and temperature.

Total ammonia levels were elevated (12 to 37 mg/L) at the start of the assays in all six elutriate solutions prepared using unmitigated sediment, which is equivalent to calculated unionized ammonia levels of 0.35 to 0.53 mg/L depending on sample pH and temperature (Table 10). These levels are higher than the target threshold of 0.1 mg/L unionized ammonia for assay initiation. Total ammonia levels decreased somewhat throughout the life of the assays, but because the pH drifted upwards of approximately 8 SU in the composite elutriate solutions this resulted in higher unionized ammonia levels at assay end (generally >0.8 mg/L in the undiluted elutriate). Ammonia was not detected in either the laboratory control or CLDS reference water at the start, and while it was detected by assay end the calculated unionized ammonia levels remained ≤ 0.03 mg/L in the controls.

US EPA guidance suggests ammonia, generally in the unionized form, can be a source of toxicity when total ammonia values are >5 mg/l (USEPA 2002). US EPA Ambient Water Quality Criteria (AWQC) for unionized ammonia in saltwater references LC-50 values for two of the species tested: *A. bahia* (1.04 mg/L) and *M. beryllina* (0.88 mg/L) (USEPA 1989). AWQC for unionized ammonia in saltwater are not available for *A. punctulata*, however effects levels are available in the literature for urchin species ranging from 0.06 mg/L for an EC-50 for development (Maguire Group Inc., 2003) to approximately 0.336 mg/L for a 96-hour LC-50 (Chang-Hoon Lee et al., 2013). Based on the calculated unionized ammonia levels, it seems likely that the total and/or unionized ammonia content contributed to the observed toxicity.

3.4.2 Mitigated Sediment

Temperature data collected during daily water quality observations documented values ranging from 19°C to 22°C, salinity levels ranging from 28 to 34‰ (values >32‰ only at assay end) and dissolved oxygen levels ranging from 5.6 to 8.7 mg/L (Table 8). Test acceptability criteria requires a mean temperature of 20±2°C (20±1°C for *A. punctulata*), salinity within a range of 30±2‰ and dissolved oxygen of ≥40% (approximately equal to 3.3 mg/L for assays maintained at 20°C, 30‰ and a barometric pressure of 760 inches Hg). There are no water quality deviations noted for any of the assays using mitigated sediment.

Total ammonia levels ranged from 1.1 to 3.4 mg/L at the start of the assays in all six elutriate solutions prepared using mitigated sediment, which is equivalent to calculated unionized ammonia levels of 0.022 to 0.090 mg/L depending on sample pH and temperature. These levels are below the target threshold of 0.1 mg/L for assay initiation. Total ammonia levels remained fairly level and in some cases slightly increased throughout the life of the assays, but pH levels generally remained level in the elutriate solutions and therefore unionized ammonia levels only slightly increased to a maximum of 0.12 mg/L (elutriate solution 5) by assay end.

3.5 Protocol Deviations

Review of the data collected for these assays documented the following deviations from the method protocol and/or ESI's standard procedures:

Protocol requires, and it is common laboratory procedure, that a reference toxicant assay be completed concurrently with any project assay (at a minimum frequency of once per month). However, the *A. punctulata* assay completed using mitigated sediment (study 31291) does not have an associated reference toxicant assay, and there are no reference toxicant data available for that lot of organisms due in part to the time of year and organism viability. While this remains a data gap, it is the opinion of ESI's technical manager that this deviation had no adverse impact on the outcome of the assay as the project assay met all acceptability criteria and there were no impacts on embryonic survival or development in the project elutriates. There are reference toxicant data available that are concurrent with the unmitigated assay (study 31248) started approximately one month prior, however these data were generated using a different lot of organisms.

Protocol requires that the *A. bahia* and *M. beryllina* assays be conducted at 20±2°C, and the *A. punctulata* assay be conducted at 20±1°C. Although the assays were maintained in incubators set at their target temperature, the minimum temperatures recorded during the unmitigated assays for elutriate solutions 3, 4 and 5 fell below the protocol range to a low of 17°C on day 2 of the mysid assay, a low of 14°C on day 2 of the minnow assay and a low of 18°C at the start of the urchin assay. There were no notations on the bench sheets indicating a reason for the low temperatures, therefore the drop below the threshold is likely due to the ambient laboratory temperature at the time that water quality measurements were taken. There was also an isolated exceedence of the upper threshold in the laboratory control of the unmitigated minnow assay for elutriate solutions 1, 2 and 6, which reached a maximum of 23°C on day 0. These species can tolerate temperatures within the ranges measured. It is the opinion of ESI's technical manager that these deviations had no adverse impact on the outcome of the assay.

In addition, the protocol requires that the assays be conducted at 30±2‰. It is not uncommon for the salinity to drift upwards during assay conduct due to evaporation and exceed the protocol requirement, but the salinities are adjusted daily as needed to account for this occurrence, except at assay termination. These occurrences at test termination are not considered deviations. In one instance the salinity in the mysid laboratory control for the mitigated assay for elutriate solutions 3, 4 and 5 was inadvertently overlooked and not adjusted down from 33 ppt at 72 hours. This was an isolated incident and all other in-life assay measurements >32 ppt were adjusted accordingly. It is the opinion of ESI's technical manager that this deviation had no adverse impact on the outcome of the assay.

3.6 Summary

This program utilized protocols developed by the US EPA and the CENAE to assess the potential impact that the proposed dredge material collected from the New Haven Harbor FNP would have on the marine environment. Impacts were evaluated using two different sediment preparations to address residual ammonia in the elutriate solutions, and results are presented for both unmitigated and mitigated sediment.

Review of the data indicates that there were significant negative effects on all three species from exposure to elutriate solutions that were prepared using unmitigated sediment from composites 3 and 5, and significant negative effects on both the minnow and urchin from most/all of the elutriate solutions prepared using unmitigated sediment. Total ammonia levels in the elutriate solutions prepared using unmitigated sediment measured ≥ 12 mg/L (equivalent to approximately ≥ 0.35 mg/L unionized ammonia) at the start of the assays and levels rose to a maximum of 31 mg/L total ammonia (2.8 mg/L unionized ammonia) by assay end. These ammonia levels likely contributed to the observed toxicity.

In contrast, there were no negative effects on any species following exposure to any of the elutriate solutions prepared using mitigated sediments, with measured total ammonia levels of up to 3.3 mg/L (equivalent to 0.090 mg/L unionized ammonia) at assay start and up to 3.7 mg/L at assay end (the maximum unionized ammonia level of 0.12 mg/L was calculated for a different sample in which the pH level increased during the life of the assay).

4.0 REFERENCES

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- US EPA 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.
- New Haven Harbor 2018 FNP Tier III Sediment Evaluation. Suspended Particulate Phase Evaluation. US ACE New England District. ESI Studies 31248 / 31291. October 2018.

**Table 1. Sample Collection and Receipt Information. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Station ID ^a	ESI Code	Sample Type	Matrix	Collection		Receipt	
				Date	Time	Date	Time
Comp V',W' Station V'	31242-001	Site	Solid	10/23/18	1125	10/24/18	1015
Comp V',W' Station W'	31242-002	Site	Solid	10/23/18	1125	10/24/18	1015
Comp R',S' Station R'	31242-003	Site	Solid	10/23/18	1215	10/24/18	1015
Comp R',S' Station S'	31242-004	Site	Solid	10/23/18	1215	10/24/18	1015
Comp CAD 1-3 Station CAD 1	31242-005	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD 2	31242-006	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD 3	31242-007	Site	Solid	10/23/18	1527	10/24/18	1015
NHH-CLDS	31242-008	Reference	Solid	10/23/18	1028	10/24/18	1015
NHH-CLDS	31242-009	Reference	Water	10/23/18	1312	10/24/18	1015
Comp TB-1-2, Station TB-1	31242-010	Site	Solid	10/24/18	1146	10/25/18	0835
Comp TB-1-2, Station TB-2	31242-011	Site	Solid	10/24/18	1146	10/25/18	0835
Comp DS-1-2, Station DS-1	31242-012	Site	Solid	10/24/18	1006	10/25/18	0835
Comp DS-1-2, Station DS-2	31242-013	Site	Solid	10/24/18	1006	10/25/18	0835
Comp US 1-2	31242-014	Site	Water	10/24/18	1130	10/25/18	0835
Comp DS 1-2	31242-015	Site	Water	10/24/18	1145	10/25/18	0835
Comp TB 1-2	31242-016	Site	Water	10/24/18	1200	10/25/18	0835
Comp CAD 1,2,3	31242-017	Site	Water	10/24/18	1215	10/25/18	0835
Comp V',W'	31242-018	Site	Water	10/24/18	1230	10/25/18	0835
Comp US-1-2, Station US-1	31242-019	Site	Solid	10/25/18	1023	10/25/18	1820
Comp US-1-2, Station US-2	31242-020	Site	Solid	10/25/18	1023	10/25/18	1820
New Haven ^b	31242-021	Site	Water	11/14/18	1413	11/14/18	1545
Comp R',S'	31242-022	Site	Water	10/24/18	1245	10/25/18	0835
Comp DS-1-2, Station DS-2	31242-023	Site	Solid	10/25/18	0946	10/25/18	1820

Notes:

^a The Station IDs listed include detailed information written on individual sample buckets.

^b This water was used only for the repeated *A. punctulata* assay.

**Table 2. Summary of Sample Compositing Information. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Composite ID	ESI Code	Components		Final Amount	Composite	
		Station ID	ESI Code		Date	Time
Composite 1	31243-100	Comp V',W' Station V'	31242-001	~7 gal	10/24/18	1100
		Comp V',W' Station W'	31242-002			
Composite 2	31243-101	Comp R',S' Station R'	31242-003	~28 gal	10/24/18	1545
		Comp R',S' Station S'	31242-004			
Composite 3	31243-102	Comp US-1-2, Station US-1	31242-019	~28 gal	10/25/18	2030
		Comp US-1-2, Station US-2	31242-020			
Composite 4	31243-103	Comp DS-1-2, Station DS-1	31242-012	~28 gal	10/25/18	2000
		Comp DS-1-2, Station DS-2	31242-013			
		Comp DS-1-2, Station DS-2	31242-023			
Composite 5	31243-104	Comp TB-1-2, Station TB-1	31242-010	~28 gal	10/25/18	1110
		Comp TB-1-2, Station TB-2	31242-011			
Composite 6	31243-105	Comp CAD 1-3 Station CAD 1	31242-005	~31 gal	10/24/18	1115
		Comp CAD 1-3 Station CAD 2	31242-006			
		Comp CAD 1-3 Station CAD 3	31242-007			

**Table 3. Summary of Ammonia Mitigation Data. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Composite ID	Hour	Date & Time Sampled	Temperature (°C)	pH (SU)	Salinity (‰)	Pore Water Ammonia (mg/L)	
						Total	Unionized
Comp 001 (V', W')	24	10/25/18 1000	18.9	7.46	30	38	0.3361
Comp 001 (V', W')	48	10/26/18 1000	20.0	7.71	30	14	0.2371
Comp 001 (V', W')	72	10/27/18 1350	20.3	7.44	30	15	0.1406
Comp 001 (V', W')	96	10/28/18 1145	17.0	7.43	30	7.8	0.0560
Comp 001 (V', W')	120	10/29/18 1130	19.5	7.37	32	5.2	0.0387
Comp 002 (R', S')	24	10/25/18 1000	18.4	7.59	30	27	0.3095
Comp 002 (R', S')	48	10/26/18 1000	20.0	7.64	30	15	0.2168
Comp 002 (R', S')	72	10/27/18 1350	19.8	7.43	30	16	0.1413
Comp 002 (R', S')	96	10/28/18 1145	17.0	7.37	32	8.4	0.0520
Comp 002 (R', S')	120	10/29/18 1130	19.7	7.39	32	7.3	0.0577
Comp 003 (US-1, US-2)	24	10/27/18 1350	21.0	7.48	30	38	0.4108
Comp 003 (US-1, US-2)	48	10/28/18 1145	18.0	7.38	32	22	0.1499
Comp 003 (US-1, US-2)	72	10/29/18 1130	19.8	7.44	32	14	0.1250
Comp 003 (US-1, US-2)	96	10/30/18 0915	13.8	7.39	32	8	0.0409
Comp 004 (DS-1, DS-2)	24	10/27/18 1350	20.0	7.61	30	31.8	0.4293
Comp 004 (DS-1, DS-2)	48	10/28/18 1145	18.0	7.56	32	15	0.1542
Comp 004 (DS-1, DS-2)	72	10/29/18 1130	19.9	7.51	32	13	0.1372
Comp 004 (DS-1, DS-2)	96	10/30/18 0915	13.5	7.54	32	6.6	0.0465
Comp 005 (TB-1, TB-2)	24	10/25/18 1000	20.0	7.70	30	31	0.5132
Comp 005 (TB-1, TB-2)	48	10/27/18 1350	20.0	7.38	30	18	0.1439
Comp 005 (TB-1, TB-2)	72	10/28/18 1145	18.0	7.39	30	13	0.0917
Comp 005 (TB-1, TB-2)	96	10/29/18 1130	20.0	7.35	32	13	0.0959
Comp 006 (CAD-1, 2 & 3)	24	10/26/18 1000	18.9	7.92	30	12	0.3011
Comp 006 (CAD-1, 2 & 3)	48	10/26/18 1000	20.0	7.62	30	5.5	0.0760
Comp 006 (CAD-1, 2 & 3)	72	10/27/18 1350	20.0	7.63	31	4.2	0.0590
Comp 006 (CAD-1, 2 & 3)	96	10/28/18 1145	19.0	7.55	32	3	0.0325
Comp 006 (CAD-1, 2 & 3)	120	10/29/18 1130	20.0	7.58	32	3	0.0374

Notes:

A complete summary of all the water quality measurements and ammonia data generated during the mitigation phase is provided in Appendix A.

**Table 4. Elutriate Solution Preparation. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Water		Sediment		Elutriate Preparation			
Station ID	ESI Code	Composite ID	ESI Code	Elutriate ID	ESI Code	Date	Time
<u>Unmitigated Assays - 31248</u>							
Comp V',W'	31242-018	Composite 1	31243-100	Composite 1 Elutriate	31246-101	10/25/18	1310
Comp R',S'	31242-022	Composite 2	31243-101	Composite 2 Elutriate	31246-103	10/25/18	1405 ^a
Comp R',S'	31242-022	Composite 2	31243-101	Composite 2 Elutriate	31246-103	10/25/18	1700
Comp US 1-2	31242-014	Composite 3	31243-102	Composite 3 Elutriate	31246-105	10/26/18	1615 ^a
Comp US 1-2	31242-014	Composite 3	31243-102	Composite 3 Elutriate	31246-105	10/26/18	1810
Comp DS 1-2	31242-015	Composite 4	31243-103	Composite 4 Elutriate	31246-107	10/26/18	1310
Comp TB 1-2	31242-016	Composite 5	31243-104	Composite 5 Elutriate	31246-109	10/26/18	1525
Comp CAD 1,2,3	31242-017	Composite 6	31243-105	Composite 6 Elutriate	31246-111	10/25/18	1520
<u>Mitigated Assays - 31291</u>							
Comp V',W'	31242-018	Composite 1	31243-100	Composite 1 Elutriate	31246-112	10/31/18	1040
Comp R',S'	31242-022	Composite 2	31243-101	Composite 2 Elutriate	31246-113	10/31/18	1040
Comp US 1-2	31242-014	Composite 3	31243-102	Composite 3 Elutriate	31246-114	10/31/18	1250
Comp DS 1-2	31242-015	Composite 4	31243-103	Composite 4 Elutriate	31246-115	10/31/18	1250
Comp TB 1-2	31242-016	Composite 5	31243-104	Composite 5 Elutriate	31246-116	10/31/18	1125
Comp CAD 1,2,3	31242-017	Composite 6	31243-105	Composite 6 Elutriate	31246-117	10/31/18	1125
<u>Mitigated – <i>A. punctulata</i> repeated assay - 31291</u>							
New Haven	31242-021	Composite 1	31243-100	Composite 1 Elutriate	31246-118	11/21/18	0900
New Haven	31242-021	Composite 2	31243-101	Composite 2 Elutriate	31246-119	11/21/18	0900
New Haven	31242-021	Composite 3	31243-102	Composite 3 Elutriate	31246-120	11/21/18	0939
New Haven	31242-021	Composite 4	31243-103	Composite 4 Elutriate	31246-121	11/21/18	0939
New Haven	31242-021	Composite 5	31243-104	Composite 5 Elutriate	31246-122	11/21/18	1030
New Haven	31242-021	Composite 6	31243-105	Composite 6 Elutriate	31246-123	11/21/18	1030

Notes:

^a This sample was used for the unmitigated SPP assay. Additional elutriate was prepared to meet the volume requirements for chemical analysis and the required QC.

**Table 5. Period of Assay Conduct. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Elutriate		Test Species	Assay Start		Assay End	
Comp/Elutriate ID	ESI Code		Date	Time ^a	Date	Time ^a
Unmitigated Assays - 31248						
Composite 1 Elutriate Composite 2 Elutriate Composite 6 Elutriate	31246-101	<i>A. bahia</i>	10/25/18	1645	10/29/18	1600
	31246-103	<i>M. beryllina</i>	10/25/18	1720	Failed ^b	
	31246-111		10/26/18	1430	10/30/18	1253
Composite 3 Elutriate Composite 4 Elutriate Composite 5 Elutriate	31246-105	<i>A. punctulata</i>	10/25/18	1735	10/29/18	1140
		<i>A. bahia</i>	10/26/18	1815	10/30/18	1615
	31246-107	<i>M. beryllina</i>	10/26/18	1710	10/30/18	1311
	31246-109	<i>A. punctulata</i>	10/27/18	1330	10/30/18	1600
Mitigated Assays - 31291						
Composite 1 Elutriate Composite 2 Elutriate Composite 3 Elutriate Composite 4 Elutriate Composite 5 Elutriate Composite 6 Elutriate	31246-112	<i>A. bahia</i>	10/31/18	1510	11/04/18	1250
	31246-113	<i>M. beryllina</i>	10/31/18	1605	11/04/18	1325
	31246-114	<i>A. punctulata</i>	10/31/18	1820	Failed ^c	
	31246-115					
	31246-116					
	31246-117					
	31246-118	<i>A. punctulata</i>	11/21/18	1310	11/24/18	0935
	31246-119					
	31246-120					
	31246-121					
	31246-122					
31246-123						

Notes:

^a Start and end times are based on when the controls were started and ended.

^b The failed *M. beryllina* assay was repeated starting on 10/26/18 using the same elutriate samples (within the hold time) and lot of test organisms.

^c The failed *A. punctulata* assay was repeated starting on 11/21/18 using newly prepared elutriate solutions and a new lot of test organisms.

**Table 6. Reference Toxicant Data Summary. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Date	Organism Lot	Endpoint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>A. bahia</i>						
10/25/18	03AbARO102418	96Hr LC-50	65.6	59.2	35.3 - 84.1	NH4Cl (mg/L)
10/31/18	02AbARO102918	96Hr LC-50	75.5	60.2	35.8 - 84.6	NH4Cl (mg/L)
<i>M. beryllina</i>						
10/25/18	08MbARO102418	96Hr LC-50	46.7	48.8 ^a	16.5 - 81.0 ^a	NH4Cl (mg/L)
10/31/18	08MbARO102918	96Hr LC-50	40.0	46.9	18.4 - 75.5	NH4Cl (mg/L)
<i>A. punctulata</i>						
10/25/18	99ApARO080118	96Hr EC-50	5.9	4.1 ^b	0.0-8.4 ^b	NH4Cl (mg/L)
11/21/18	No data ^c					

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays unless otherwise noted.

Notes:

^a Values based on the results of 19 assays.

^b Values based on the results of 7 assays.

^c Reference toxicant data are not available. See Section 3.5 for a discussion of the deviation.

Table 7. Summary of Assay Acceptability and Laboratory Control Performance – Unmitigated Assays (31248). SPP Evaluation. New Haven Harbor FNP. New Haven, Connecticut. October 2018.

Endpoint	Protocol Criteria	Elut ID	<i>A. bahia</i>		<i>M. beryllina</i>		<i>A. punctulata</i>	
Mean Survival	Lab Control survival ≥90% (≥70% surv/norm Ap)	Lab	Surv 100% (1,2,6) 100% (3,4,5)		Surv 96% (1,2,6) 90% (3,4,5)		Surv 78% (1,2,6) 86% (3,4,5)	Norm 77% (1,2,6) 85% (3,4,5)
Salinity ^a	Minimum: 28‰ Maximum: 32‰	Lab ^b	Min‰	Max‰	Min‰	Max‰	Min‰	Max‰
		CLDS ^b	30	33 ^c	29	33 ^a	30	32
		1	28	32	28	31	28	31
		2	29	32	28	31	29	29
		3	29	31	28	31	29	29
		4	28	32	28	33 ^a	30	32
		5	28	31	28	32	29	30
6	28	32	28	32	29	31		
6	29	33 ^a	28	32	29	31		
Temperature	Minimum: 18°C (19°C Ap) Maximum: 22°C (21°C Ap)	Lab ^b	Min°C	Max°C	Min°C	Max°C	Min°C	Max°C
		CLDS ^b	18	21	17 ^c	23 ^c	19	21
		1	18	20	18	20	19	21
		2	18	20	18	21	19	21
		3	17 ^c	20	14 ^c	20	19	20
		4	17 ^c	20	16 ^c	20	19	20
		5	17 ^c	19	15 ^c	19	18 ^c	20
6	19	21	18	20	20	21		
pH	No requirement	Lab ^b	Min SU	Max SU	Min SU	Max SU	Min SU	Max SU
		CLDS ^b	7.73	7.96	7.75	7.97	7.92	8.04
		1	7.69	7.98	7.80	7.92	7.91	8.08
		2	7.68	8.30	7.63	8.31	7.68	8.43
		3	7.74	8.34	7.74	8.26	7.73	8.42
		4	7.70	8.32	7.69	8.27	7.76	8.32
		5	7.77	8.34	7.76	8.30	7.87	8.36
6	7.62	8.33	7.66	8.25	7.70	8.35		
6	7.85	8.25	7.78	8.20	7.86	8.35		
Dissolved oxygen	Minimum: ≥40% ^d (No requirement for Ap)	Lab ^b	Min mg/L	Max mg/L	Min mg/L	Max mg/L	Min mg/L	Max mg/L
		CLDS ^b	5.9	8.8	6.5	8.8	7.4	8.0
		1	5.9	10.1	6.8	10.1	7.6	8.9
		2	5.5	8.2	6.2	8.3	6.6	8.4
		3	6.5	8.2	5.8	8.2	7.3	8.4
		4	6.0	9.8	7.0	9.8	7.5	8.7
		5	6.5	9.8	6.7	9.8	7.6	8.7
6	6.2	9.6	6.6	9.6	7.5	8.8		
6	6.4	8.1	6.6	8.1	7.2	8.2		

Notes:

Ap = *Arbacia punctulata*

^a Adjustments were made, as needed, to bring salinity values back within the acceptable range and values reported herein represent the adjusted value, except for final readings at 96 hours that typically are not adjusted and are not considered a deviation.

^b The range of values provided is inclusive of both laboratory controls and reference samples associated with the two batches of unmitigated assays that were completed.

^c Refer to Section 3.5 for a discussion of the deviation.

^d Dissolved oxygen measurements were collected in mg/L, rather than % saturation. The minimum requirement of ≥40% is approximately equal to 3.3 mg/L for assays maintained at 20°C, 30‰ and a barometric pressure of 760 inches Hg.

Table 8. Summary of Assay Acceptability and Laboratory Control Performance – Mitigated Assays (31291). SPP Evaluation. New Haven Harbor FNP. New Haven, Connecticut. October 2018.

Endpoint	Protocol Criteria	Elut ID	<i>A. bahia</i>		<i>M. beryllina</i>		<i>A. punctulata</i>	
Mean Survival	Lab Control survival ≥90% (≥70% surv/norm Ap)	Lab	Surv 100%		Surv 90%		Surv 76%	Norm 74%
			Min‰	Max‰ ^a	Min‰	Max‰	Min‰	Max‰
Salinity ^a	Minimum: 28‰ Maximum: 32‰	Lab	31	34 ^a	31	32	31	33 ^a
		CLDS	29	33 ^a	29	32	31 ^b	33 ^b
		1	28	32	28	31	30	33 ^a
		2	28	31	28	32	30	33 ^a
		3	28	31	28	31	30	34 ^a
		4	28	31	28	31	30	34 ^a
		5	28	31	28	31	31	33 ^a
6	28	31	28	31	30	33 ^a		
Temperature	Minimum: 18°C (19°C Ap) Maximum: 22°C (21°C Ap)	Lab	19	20	19	20	19	20
		CLDS	19	20	19	20	19 ^b	20 ^b
		1	20	21	20	21	20	21
		2	19	20	19	20	19	21
		3	20	21	20	21	20	20
		4	19	20	19	20	20	20
		5	19	20	19	20	20	20
6	20	22	20	22	20	21		
pH	No requirement	Lab	7.70	8.00	7.60	8.00	7.91	8.00
		CLDS	7.71	7.97	7.82	7.97	7.91 ^b	8.00 ^b
		1	7.76	7.96	7.77	7.96	7.79	8.05
		2	7.64	7.97	7.74	7.97	7.72	8.13
		3	7.69	7.98	7.77	7.98	7.98	8.11
		4	7.68	7.97	7.73	7.97	7.95	8.15
		5	7.74	7.97	7.74	7.97	7.74	8.14
6	7.68	7.97	7.76	7.97	7.88	8.12		
Dissolved oxygen	Minimum: ≥40% ^c (No requirement for Ap)	Lab	6.2	7.3	5.8	7.3	7.5	7.8
		CLDS	5.8	8.7	6.3	8.7	7.5 ^b	7.8 ^b
		1	5.9	8.4	6.1	8.4	7.2	7.6
		2	5.8	8.4	5.8	8.4	7.0	7.5
		3	5.6	8.4	5.6	8.4	6.8	7.6
		4	5.7	8.3	5.7	8.3	6.7	7.6
		5	5.7	8.2	5.8	8.2	6.4	7.6
6	5.7	8.4	5.8	8.4	7.3	7.6		

Notes:

Ap = *Arbacia punctulata*

^a Adjustments were made, as needed, to bring salinity values back within the acceptable range and values reported herein represent the adjusted value, except for final readings at 96 hours that typically are not adjusted and are not considered a deviation.

^b The CLDS reference was not included with the *A. punctulata* re-test because the sample had exceeded its hold time.

^c Dissolved oxygen measurements were collected in mg/L, rather than % saturation. The minimum requirement of ≥40% is approximately equal to 3.3 mg/L for assays maintained at 20°C, 30‰ and a barometric pressure of 760 inches Hg.

**Table 9. Summary of Endpoints and Adverse Effects. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Station	Comp/Elutriate ID	ESI Code	<i>A. bahia</i> LC-50 (Survival)	<i>M. beryllina</i> LC-50 (Survival)	<i>A. punctulata</i> LC-50 (Survival)	EC-50 (Development)
<u>Unmitigated Assays</u>						
V',W'	Composite 1 Elutriate	31246-101	>100%	65%	7%	4%
R',S'	Composite 2 Elutriate	31246-103	>100%	57%	13%	4%
US-1,US-2	Composite 3 Elutriate	31246-105	74%	58%	3%	3%
DS-1,DS-2	Composite 4 Elutriate	31246-107	>100%	69%	10%	7%
TB-1,TB-2	Composite 5 Elutriate	31246-109	73%	56%	5%	4%
CAD-1,CAD-2,CAD-3	Composite 6 Elutriate	31246-111	>100%	>100%	22%	22%
<u>Mitigated Assays</u>						
V',W'	Composite 1 Elutriate	31246-112	>100%	>100%	>100%	>100%
R',S'	Composite 2 Elutriate	31246-113	>100%	>100%	>100%	>100%
US-1,US-2	Composite 3 Elutriate	31246-114	>100%	>100%	>100%	>100%
DS-1,DS-2	Composite 4 Elutriate	31246-115	>100%	>100%	>100%	>100%
TB-1,TB-2	Composite 5 Elutriate	31246-116	>100%	>100%	>100%	>100%
CAD-1,CAD-2,CAD-3	Composite 6 Elutriate	31246-117	>100%	>100%	>100%	>100%

**Table 10. Summary of Water Quality Data – Unmitigated Assays. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Elutriate ID	Temperature		pH (SU)		Salinity (‰)		Ammonia (mg/L)		Ammonia (mg/L)	
	Start	End	Start	End	Start	End	Start	End	Total	Unionized
<i>A. bahia</i>										
Lab Control	20	19	7.96	7.76	31	31	<0.1	<0.0030	1.6	0.0280
CLDS Reference	20	19	7.91	7.74	29	32	<0.1	<0.0027	1.6	0.0267
Comp 1 Elutriate	20	19	7.68	8.30	29	32	33	0.5251	17	0.9850
Comp 2 Elutriate	19	19	7.78	8.34	29	31	35	0.6489	19	1.2067
Comp 6 Elutriate	20	19	7.97	8.25	31	31	12	0.3627	6	0.3135
Lab Control	21.0	19	7.95	7.73	30.4	33	<0.1	<0.0031	1.4	0.0227
CLDS Reference	20.0	19	7.87	7.69	27.6	30	<0.1	<0.0025	1.5	0.0226
Comp 3 Elutriate	19.8	19	7.70	8.32	28.0	32	34	0.5609	25	1.5126
Comp 4 Elutriate	19.9	19	7.77	8.34	28.2	31	27	0.5251	22	1.3973
Comp 5 Elutriate	19.3	19	7.62	8.33	28.7	32	37	0.4888	28	1.7311
<i>M. beryllina</i>										
Lab Control	23	19	7.92	7.75	30	30	<0.1	<0.0034	1.6	0.0276
CLDS Reference	19	19	7.89	7.80	28	31	<0.1	<0.0024	1.7	0.0326
Comp 1 Elutriate	21	19	7.63	8.31	28	31	35	0.5381	25	1.4881
Comp 2 Elutriate	20	19	7.74	8.26	28	30	33	0.6048	25	1.3421
Comp 6 Elutriate	19	19	7.98	8.20	28	32	12	0.3508	9.3	0.4332
Lab Control	22.0	18	7.97	7.86	30.3	33	<0.1	<0.0035	1.4	0.0283
CLDS Reference	20.0	18	7.88	7.82	27.5	31	<0.1	<0.0025	1.3	0.0243
Comp 3 Elutriate	19.8	17	7.69	8.27	29.0	32	34	0.5453	24	1.1307
Comp 4 Elutriate	20.0	18	7.76	8.30	28.1	32	27	0.5174	20	1.0800
Comp 5 Elutriate	19.2	15	7.66	8.25	28.7	31	37	0.5314	29	1.1396
<i>A. punctulata</i>										
Lab Control	20	21	7.98	8.02	31	32	<0.1	<0.0031	0.36	0.0130
CLDS Reference	19	21	7.91	8.06	29	31	<0.1	<0.0025	0.3	0.0119
Comp 1 Elutriate	21	21	7.68	8.43	29	29	33	0.5650	31	2.7659
Comp 2 Elutriate	20	21	7.73	8.42	29	29	35	0.6236	29	2.5337
Comp 6 Elutriate	20	21	7.97	8.35	31	31	12	0.3627	11	0.8202
Lab Control	19.0	20.4	7.92	8.04	31	30.3	<0.1	<0.0025	0.9	0.0328
CLDS Reference	18.5	20.5	7.95	8.08	30	28.1	<0.1	<0.0026	0.14	0.0057
Comp 3 Elutriate	19.9	19.9	7.76	8.32	30	30.9	34	0.6400	20	1.2963
Comp 4 Elutriate	20.1	20.0	7.87	8.36	30	30.0	30	0.7342	23	1.6434
Comp 5 Elutriate	20.1	19.9	7.70	8.35	30	29.8	36	0.6004	22	1.5296

Notes:

Water quality measurements and ammonia samples were obtained from replicate A, and a summary of these data is provided in Appendix A.

**Table 11. Summary of Water Quality Data – Mitigated Assays. SPP Evaluation.
New Haven Harbor FNP. New Haven, Connecticut. October 2018.**

Elutriate ID	Temperature		pH (SU)		Salinity (‰)		Ammonia (mg/L)		Ammonia (mg/L)	
	Start	End	Start	End	Start	End	Start	End	Total	Unionized
<i>A. bahia</i>										
Lab Control	19	20	8.00	7.84	31	34	<0.1	<0.0030	1.4	0.0311
CLDS Reference	19	20	7.97	7.73	29	33	<0.1	<0.0028	1.7	0.0296
Comp 1 Elutriate	21	20	7.83	7.82	28	30	2	0.0483	2.9	0.0630
Comp 2 Elutriate	19	20	7.85	7.80	28	30	3.1	0.0677	3.7	0.0768
Comp 3 Elutriate	21	20	7.79	7.83	28	30	3.4	0.0750	3.5	0.0777
Comp 4 Elutriate	19	20	7.95	7.89	28	30	3.3	0.0902	3.5	0.0889
Comp 5 Elutriate	19	20	7.86	7.91	28	30	2.9	0.0648	3	0.0797
Comp 6 Elutriate	22	20	7.97	7.86	28	29	1.2	0.0426	2.6	0.0621
<i>M. beryllina</i>										
Lab Control	19	20	8.00	7.73	31	32	<0.1	<0.0030	2	0.0350
CLDS Reference	19	20	7.97	7.82	29	32	<0.1	<0.0028	2.2	0.0472
Comp 1 Elutriate	21	20	7.83	7.86	28	30	2	0.0483	2.9	0.0689
Comp 2 Elutriate	19	20	7.85	7.92	28	32	3.1	0.0677	3.3	0.0887
Comp 3 Elutriate	21	20	7.79	7.84	28	30	3.4	0.0750	3.7	0.0840
Comp 4 Elutriate	19	20	7.95	7.89	28	30	3.3	0.0902	3.5	0.0889
Comp 5 Elutriate	19	20	7.80	7.88	28	30	2.9	0.0566	3.2	0.0795
Comp 6 Elutriate	22	20	7.97	7.81	28	29	1.2	0.0426	2.6	0.0555
<i>A. punctulata</i>										
Lab Control	19	20	7.91	8.00	31	33	<0.1	<0.0025	0.15	0.0048
Comp 1 Elutriate	20	21	7.79	8.04	30	31	1.1	0.0223	1.2	0.0456
Comp 2 Elutriate	19	21	7.72	8.13	30	32	2.4	0.0386	2.4	0.1105
Comp 3 Elutriate	20	20	8.01	8.11	30	31	1.4	0.0465	1.4	0.0578
Comp 4 Elutriate	20	20	8.01	8.15	30	32	2.3	0.0764	2.2	0.0986
Comp 5 Elutriate	20	20	7.74	8.14	32	32	2.6	0.0466	2.7	0.1184
Comp 6 Elutriate	20	21	7.88	8.12	30	30	1.7	0.0422	1.8	0.0820

Notes:

Water quality measurements and ammonia samples were obtained from replicate A, and a summary of these data is provided in Appendix A.

APPENDIX A:
RAW DATA & STATISTICAL SUPPORT

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Mitigated Assays - Bench Sheets (Assay Summary, Organism History, Dilutions, Survival and Water Quality)	13
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STUDY NUMBER RECORD

Issue and complete this form for studies that will require multiple tasks and directly associated support studies. Issue consecutive study numbers at the start of the project to cover all potential elements of the project.

CLIENT: AECOM

CONTACT(S): Kris Van Naerssen

PROJECT: New Haven Harbor 2018

APP. NUMBER:

	Species / Analysis Parameters:	STUDY:
Sample Receipt:		31242
Rinseate Sample Analysis:	Reference Site Analyzed x 3	
Grain Size Analysis:		
Composite Prep/NH3 Mit:		31243
Bulk Sediment Analysis:		
10 Day Assay:	<i>Leptocheirus plumulosus</i>	31244
	<i>Americamysis bahia</i>	31245
Elutriate Preparation:	Type:	31246
Elutriate Analysis:	Pentachlorophenol	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Trace Metals	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PCB Congeners	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Pesticides	<input checked="" type="radio"/> Yes / <input type="radio"/> No
		31247
SPP Assays/NH3 Mit:	<i>Menidia beryllina</i>	
	<i>Americamysis bahia</i>	31248
	<i>Arbacia punctulata</i>	
Bioaccumulation Study:	<i>Macoma nasuta</i>	31249
	<i>Nereis virens</i>	31250
Tissue Analysis:	Trace Metals	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PAH Compounds	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PCB Congeners	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Pesticides	<input checked="" type="radio"/> Yes / <input type="radio"/> No


Tissue analyses completed by Alpha Analytical

CHAIN OF CUSTODY RECORD

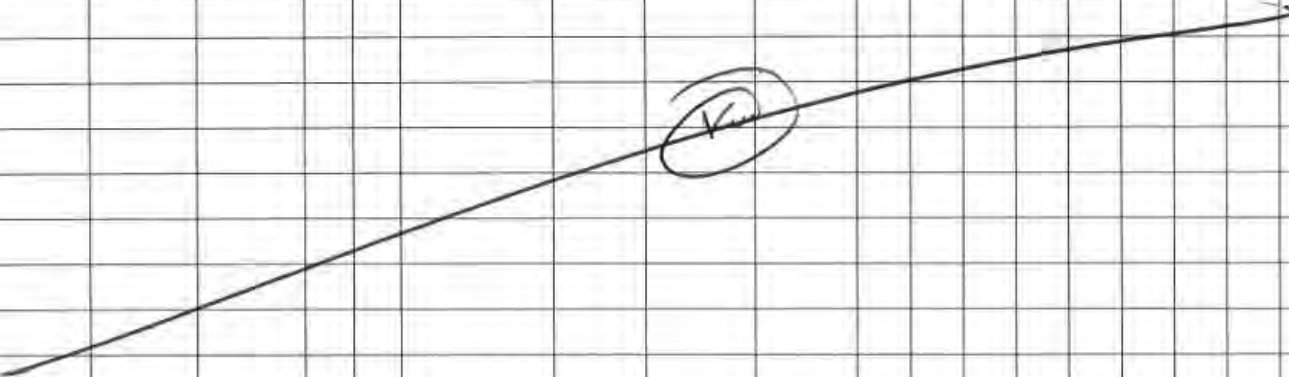
31292

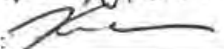
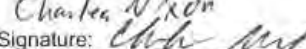
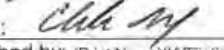
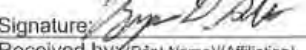
PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	EWTRTATE TESTER	SUSPENDED PHASE TEST	10-DAY WHOLE SED. TEST	28-DAY PROXIMUM			REMARKS
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION								
RICHARD LOYD <i>Richard B. Loyd</i>		NEW HAVEN HARBOR											
10/16/22 10/20/22 10/21/22 1	1	10/23	11:25	/		2	/	/				STATIONS U', W'	
	2	10/23	12:15	/		8	/	/	/			STATIONS R', S'	
	3	10/23	15:27	/		9	/	/	/			STATIONS CAD-1, CAD-2, CAD-3	
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Received by: (Signature)				
<i>Richard B. Loyd</i>		10/23/1800	<i>Chloe My</i>			<i>Chloe My</i>		10/23/18	10:15	<i>Peggy D. Adair</i>			
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Received by: (Signature)				
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS						

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Client/Project Name: <i>USACE / AECOM</i>		Project Location: <i>New Haven Harbor / Central CI Disposal Site</i>		Analysis Requested	
Project Number: <i>60588790</i>		Field Logbook No.:			
Sampler (Print Name)/(Affiliation): <i>K. VAN NARSSON / AECOM</i>		Chain of Custody Tape Nos.: <i>N/A</i>			
Signature: 		Send Results/Report to: <i>K. van Narsson</i>		TAT: <i>A3</i> <i>FOR WORK PLAN</i>	

Container Type		Preservation	
P - Plastic	1 - HCl, 4"	2 - H2SO4, 4"	3 - HNO3, 4"
A - Amber Glass	4 - NaOH, 4"	5 - NaOH/ZnAc, 4"	6 - Na2S2O3, 4"
G - Clear Glass	7 - 4"		
V - VOA Vial			
O - Other			
E - Encore			
Matrix Codes:			
DW - Drinking Water	S - Soil		
WW - Wastewater	SL - Sludge		
GW - Groundwater	SD - Sediment		
SW - Surface Water	SO - Solid		
ST - Storm Water	A - Air		
W - Water	L - Liquid		
	P - Product		

Field Sample No./Identification	Date	Time	COM P	GRA B	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	<i>ELU TRIMATE PREP</i>				Lab I.D.	Remarks
<i>NHH-CLDS</i>	<i>10/23/18</i>	<i>10:28</i>	<i>X</i>	<i>X</i>	<i>3.5 G (6)</i>	<i>SD</i>	<i>7</i>	<i>NO</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>		<i>FOR WORK PLAN</i>
<i>NHH-CLDS</i>	<i>10/23/18</i>	<i>13:12</i>	<i>X</i>	<i>X</i>	<i>5 G (10)</i>	<i>SW</i>	<i>7</i>	<i>NO</i>	<i>X</i>	<i>X</i>				<i>FOR WORK PLAN / RIM</i>
														

Relinquished by: (Print Name)/(Affiliation) <i>K. van Narsson / AECOM</i>		Date: <i>10/23/18</i>		Received by: (Print Name)/(Affiliation) <i>Charles Nixon</i>		Date: <i>10/23</i>		Analytical Laboratory (Destination):			
Signature: 		Time: <i>17:15</i>		Signature: 		Time: <i>17:15</i>					
Relinquished by: (Print Name)/(Affiliation) <i>Charles Nixon AECOM</i>		Date: <i>10/24</i>		Received by: (Print Name)/(Affiliation)		Date: <i>10/24/18</i>		Sample Shipped Via: Temp blank			
Signature: 		Time: <i>10:15</i>		Signature: 		Time: <i>10:15</i>					
Relinquished by: (Print Name)/(Affiliation)		Date:		Received by: (Print Name)/(Affiliation)		Date:		UPS FedEx Courier Other Yes No			
Signature:		Time:		Signature:		Time:					

Q:\GRAPHICS\FORMS\Chain of Custody (COC)\Chain-of-Custody_AECOM_06_3NCR.doc

White: Original (to Lab) Yellow: Lab Pink: Sampler

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/24/18 1015 Date and Time Logged into Lab: 10/31/18 1630
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 5 Custody Seals intact? NA
 Number of COC Pages: 2
 COC Serial Number(s): 02668
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp V',W' Station V'	31242-001	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp V',W' Station W'	31242-002	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp R',S' Station R'	31242-003	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp R',S' Station S'	31242-004	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 1	31242-005	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 2	31242-006	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 3	31242-007	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
NHH-CLDS	31242-008	S	10-Day Solid Phase, 28-Day Bioaccumulation	6x3.5gal	4 C	Yes
NHH-CLDS	31242-009	W	SPP Assay, 10-Day Solid Phase, 28-Day Bioaccumulation	10x3.5gal	4 C	Yes

Notes and qualifications:

See COC

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	ELUTRIATE PREP	SUSPENDED PHASE TEST	10 DAY WHOLES SEPTOX	28-DAY BIOACCUM	REMARKS
NEW HAVEN HARBOR		SAMPLERS: (Signature) RICHARD LOYD <i>[Signature]</i>									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/24		/		COMP TB1-2	8	/	/	/	/	SED FROM STATIONS TB-1 & TB-2
2	10/24		/		COMP DS1-2	5	/	/	/	/	SED FROM STATIONS DS-1 & DS-2
3					COMP US1-2	8	/	/			WATER FROM NEW HAVEN HBR
4					COMP DS1-2	8	/	/			
5					COMP TB1-2	6	/	/			
6					COMP CAD1,2,3	6	/	/			
7					COMP U'W'	6	/	/			
8					COMP R'S'	8	/	/			
Relinquished by: (Signature) <i>[Signature]</i>			Date/Time 10/24/15 4:45	Received by: (Signature) Charles Nixon 10/24/15 2:25			Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 10/25/15 8:35	Received by: (Signature) <i>[Signature]</i>		
Relinquished by: (Signature)			Date/Time	Received by: (Signature)			Relinquished by: (Signature)	Date/Time	Received by: (Signature)		
Relinquished by: (Signature)			Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS CAD 1,2,3 7 containers received DS1-2 6 containers received			

Distribution: Original Accompanies Shipment Copy to 1 to Sample Custodian Copy 2 to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME					NO. OF CONTAINERS	GLUCONATE PRES	SUSPENDED PARTIC	10-DAY UNFILTERED TSS	28-DAY BROOKLYN	REMARKS
		NEW HAVEN HARBOR										
SAMPLERS: (Signature)		RICHARD LOYD <i>Richard B. Loyd</i>										
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION							
011	1	10/24	11:46	/	COMP TB 1-2	8	/	/	/	/	SED FROM STATIONS TB-1 & TB-2	
012	2	10/24	10:06	/	COMP DS 1-2	5	/	/	/	/	SED FROM STATIONS DS-1 & DS-2	
014	3	10/24	11:30		COMP US 1-2	8	/	/			WATER FROM NEW HAVEN HBR	
015	4	10/24	11:45		COMP DS 1-2	8	/	/				
016	5	10/24	12:00		COMP TB 1-2	6	/	/				
017	6	10/24	12:15		COMP CAD 1,2,3	6	/	/				
017	7	10/24	12:30		COMP U'W'	6	/	/				
017	8	10/24	12:45		COMP R'S'	8	/	/				
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Relinquished by: (Signature)	Date/Time	Received by: (Signature)					
<i>Richard B. Loyd</i>		10/24/15 15:45	<i>Charles N. von</i> 10/24/15 15:25		<i>Chad King</i>	10/24/15 15:45	<i>By: J. White</i>					
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Relinquished by: (Signature)	Date/Time	Received by: (Signature)					
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)		Date/Time	REMARKS						
						CAD 1,2,3 7 subsamples received DS 1-2 6 subsamples received						

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Richard B. Loyd
Digitally signed by
Richard B. Loyd
DN: cn=Richard B. Loyd, o=U.S. Government,
ou=USACE, email=richard.b.loyd@usace.army.mil,
c=US

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 0835 Date and Time Logged into Lab: 11/27/18 1240
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp TB-1-2, Station TB-1	31242-010	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp TB-1-2, Station TB-2	31242-011	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-1	31242-012	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-013	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	1x3.5gal	4 C	Yes
Comp US 1-2	31242-014	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp DS 1-2	31242-015	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp TB 1-2	31242-016	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp CAD 1,2,3	31242-017	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp V',W'	31242-018	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp R',S'	31242-022	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes

Notes and qualifications:

See COC



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab:

ALPHA Job #:

Project Information

Project Name: **NEW HAVEN HARBOR**

Project Location: **NEW HAVEN, CT**

Project #:

Project Manager: **RICHARD LOYD**

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program Criteria

Client Information

Client: **US ARMY CORPS OF ENG.**

Address: **696 VIRGINIA RD
CONCORD, MA 01742**

Phone: **978-318-8048**

Email: **RICHARD.B.LOYD@USACE.ARMY.MIL**

Additional Project Information:

ANALYSIS

VOC SVOC METALS METALS-EPH EPH TPH PCB TPH-Quant Only EPH-Targeted
 BZ4 BBN PAR MCP 14 RCR 238 Ranges Only Ranges Only Ranges Only

ELUTRATE PREP

SPP TOX

10-DAY WHOLE SED TOX

28-DAY BIOASSAY

SAMPLE INFO

Filtration
 Field Lab to do
 Preservation
 Lab to do

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
	COMP DS 1-2	10/25	9:46	SE	RBL
	COMP US 1-2	10/25	10:23	SE	RBL

STATION DS-23
STATIONS US1928

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - E= Encore
 - D= BOD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO₃
 - D= H₂SO₄
 - E= NaOH
 - F= MeOH
 - G= NaHSO₄
 - H= Na₂S₂O₅
 - I= Ascorbic Acid
 - J= NH₄Cl
 - K= Zn Acetate
 - O= Other

Container Type	P P P P
Preservative	A A A A

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Richard B. Loyd</i>	10/25 13:30	<i>John [unclear]</i>	10/25 1350
<i>John [unclear]</i>	10/25 1820	<i>John [unclear]</i>	10/25/18 1820

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 1820 Date and Time Logged into Lab: 11/27/18 1245
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp US-1-2, Station US-1	31242-019	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp US-1-2, Station US-2	31242-020	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-023	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes

Notes and qualifications:

See COC



EnviroSystems, Inc.
 1 Lafayette Road
 P.O. Box 778
 Hampton, N.H. 03843

Voice: 603-926-3345
 FAX: 603-926-3521

ESI Job No:

31242

CHAIN OF CUSTODY DOCUMENTATION

Client: USACE NAE	Contact: Ben Loyd	Project Name: New Haven	Page _____ of _____
Report to:	Address:	Project Number:	
Invoice to:	Address:	Project Manager:	
Voice:	Fax:	email: Richard.B.Loyd@usace.army.mil	P.O. No: _____ Quote No: _____

Protocol:		RCRA	SDWA	NPDES	USCOE	Other					Analyses Requested/ Special Instructions:
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	
010	NEW HAVEN	11/14	2:15	RS	G	5gal Containers	P	4°C	W	N	(7 containers) SPP/Eutriate Prep

Relinquished By: Sarah Turner	Date: 11/14/18	Time: 3:45	Received By: RS	Date: 11/14/18	Time: 15:45
Relinquished By: _____	Date: _____	Time: _____	Received at Lab By: _____	Date: _____	Time: _____

Comments:

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: ESI
 Date and Time Received: 11/14/18 1545 Date and Time Logged into Lab: 11/27/18 1250
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
New Haven	31242-021	W	Elutriate Prep, SPP Assay	7x5gal	4 C	Yes

Notes and qualifications:

See COC

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 1
 Composite Lab ID.: 31243-100 Composite Final Volume: ≈ 7 gal
 Composite Matrix: Solid Composite Container(s): 2 x 3.5 gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1100
 Initials: CFS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
V	31242-001	S	Na	1 Shell	≈ 3.5 gal	
W	31242-002	S	Na	Na	≈ 3.5 gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 2
 Composite Lab ID.: 31243-101 Composite Final Volume: ~ 23g
 Composite Matrix: Solid Composite Container(s): 8x3.5gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1545
 Initials: MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
R	31242-003	Solid	None	50mL	~ 14g	most dark gray mud, some shells excluded
S	31242-004	Solid	None	50mL	~ 14g	most dark gray mud, some shells exclude

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 3
 Composite Lab ID.: 31243-102 Composite Final Volume: = 28 gal
 Composite Matrix: Solid Composite Container(s): 8x 3.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 2030
 Initials: GRS/MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
US-1	31242-011	S	-	± 10ml	± 1/4 gal	Leaves, sticks
US-2	31242-020	S	-	± 10ml	± 1/4 gal	Leaves, sticks

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 4
 Composite Lab ID.: 31243-103 Composite Final Volume: 228g
 Composite Matrix: Solid Composite Container(s): 8x3.5g
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1000
 Initials: BG/LAG
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
DS-1	31242-012	S	—	~ 10g	~ 1g	
DS-2	31242-001-029	S	—	~ 10g rubs	~ 1g	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 5
 Composite Lab ID.: 31243-104 Composite Final Volume: ≈ 28 gal
 Composite Matrix: Solid Composite Container(s): 8 x 2.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1110
 Initials: CFS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
TB-1	31243-104	S	Na	2 Shells	≈ 14gal	
TB-2	31243-104	S	Na	Leaves	≈ 14gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 6
 Composite Lab ID.: 31243-105 Composite Final Volume: ≈ 31 gal
 Composite Matrix: Solid Composite Container(s): 9 x 8.5 gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1115
 Initials: BH
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
CAD-1	31242-005	S	—	≈ 1 L	≈ 10 gal	shells and rocks included
CAD-2	31242-006	S	—	≈ 500 mL	≈ 7 gal	
CAD-3	31242-007	S	—	≈ 1 L	≈ 14 gal	
						All to back sediments with a portion small

Subsamples Removed:

Lab Number	Sample Use
31246	Elutriate Preparation

Pre-Test Ammonia Mitigation Pore Water Data

Pore Water pH Record

Study: 31243 Client: AECOM Project: New Haven

Pore Water Quality

Sample	Salinity	Temperature	pH value
Composite 1 (VW)	30	18.9	7.46 18.9 (E3MS) 18.9/125
Composite 2 (RS)	30	18.4	7.59
Composite 6 (CADS)	30	18.9	7.92

Date: 10/25/18
Initial: MS
pH Meter ID: ML01

Pore Water pH Record

Study: 31243
Client: AECOM
Project: New Haven

Pore Water Quality

	Sample	Salinity	Temperature °C	pH value
203	Composite 1 (VW)	30	20.3	7.71
204	Composite 2 (RS)	30	19.8	7.64
	Composite 3 (US)			
205	Composite 4 (DS) 5 (TB)	30	19.9	7.70
	Composite 5 (TB)			
206	Composite 6 (CADS)	30	19.7	7.62
Date: 10/26/18		pH Meter ID: MLO2		
Initial: MS		Salinity Meter: ESI #1		

	Sample	Salinity	Temperature °C	pH value
207	Composite 1 (VW)	30	20	7.44
210	Composite 2 (RS)	30	20	7.43
211	Composite 6 (CADS)	30	21	7.48
212	Composite 4 (DS)	30	20	7.61
213	Composite 5 (TB)	30	20	7.38
214	Composite 6 (CADS)	31	20	7.63
Date: 10/27/18		pH Meter ID: MLO1		
Initial: GRS		Salinity Meter: ESI #1		

	Sample	Salinity	Temperature °C	pH value
215	Composite 1 (VW)	30	17	7.43
216	Composite 2 (RS)	32	17	7.37
217	Composite 6 (CADS)	32	18	7.38
218	Composite 4 (DS)	32	18	7.56
219	Composite 5 (TB)	30	18	7.39
220	Composite 6 (CADS)	32	19	7.55
Date: 10/28/18		pH Meter ID: MLO1		
Initial: PLS		Salinity Meter: ESI #1		

Pore Water pH Record

Study: 31243 Client: AECOM Project: New Haven
--

Pore Water Quality

221 219
 222 220
 223 221
 224 222
 225 223
 226 224
 (226) 10/21

Sample	Salinity	Temperature	pH value
Composite 1 (VW)	32	19.5	19.5 7.37
Composite 2 (RS)	32	19.7	7.39
Composite 3 (US)	32	19.8	7.44
Composite 4 (DS)	32	19.9	7.51
Composite 5 (TB)	32	20.0	7.35
Composite 6 (CADS)	32	20.0	7.58
Date: 10/29/18 pH Meter ID: MLo1 Initial: MS Salinity Meter: ESI #1			

227
 228

Sample	Salinity	Temperature	pH value
Composite 1 (VW)			
Composite 2 (RS)			
Composite 6 (CADS)	32	13.8	7.39
Composite 4 (DS)	32	13.5	7.54
Composite 5 (TB)			
Composite 6 (CADS)			
Date: 10/30/18 pH Meter ID: MLo1 Initial: MS Salinity Meter: ESI #1			

Sample	Salinity	Temperature	pH value
Composite 1 (VW)			
Composite 2 (RS)			
Composite 6 (CADS)			
Composite 4 (DS)			
Composite 5 (TB)			
Composite 6 (CADS)			
Date: pH Meter ID: Initial: Salinity Meter:			

Study: 31243² ^{ESI#1} 11/03

Client: AECOM

Project: New Haven

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature °C	Salinity	pH value
Comp R,S	31243-101	605	19.7	28	7.56
Comp U,S	31243-102	606	19.4	30	7.47
Comp D,S	31243-103	607	19.8	32	7.61
Comp T,B	31243-104	608	19.9	30	7.59
Comp CAD	31243-105	609	20.0	32	7.75

Date: 11/03/18 pH Meter ID: ML02 Salinity Meter ID: ESI#1
Initial: BG

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature °C	Salinity	pH value
Comp R,S	31243-101	610	20.2	30	7.62
Comp U,S	31243-102	611	20.2	30	7.57
Comp D,S	31243-103	612	20.2	30	7.64
Comp T,B	31243-104	613	20.4	30	7.60
Comp CAD	31243-105	614	20.2	30	7.75

Date: 11/03/18 pH Meter ID: ML02 Salinity Meter ID: ESI#1
Initial: BG

Study: 31242
Client: AECOM
Project: New Haven

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Lab Control	31243-000	700	19.3	31	4.37
CLDS Ref	31242-009	701	18.4 20.1	31 30	4.61 7.68
Lab Control	31243-000	702 708	18.4	31	4.61
CLDS Ref	31242-009	703 709	21.0	30	4.19
Comp V, W	31243-001	704 702	20.1	30	7.64
Comp R, S	31243-002	705 703	19.7	30	7.55
Comp U, S	31243-003	706 704	19.8	30	7.61
Comp D, S	31243-004	707 705	20.3	30	7.68
Comp T, B	31243-005	708 706	20.6	30	7.76
Comp CAD	31243-006	709 707	20.2	30	7.70

Date: 11/07/18 pH Meter ID: MLo2 Salinity Meter ID: ESI # 1
Initial: MS

Day 02 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	710	21.1	30	7.58
Comp R, S	31243-002	711	21.0	30	7.60
Comp U, S	31243-003	712	21.1	30	7.59
Comp D, S	31243-004	713	21.1	30	7.69
Comp T, B	31243-005	714	21.0	30	7.56
Comp CAD	31243-006	715	21.1	30	7.70

Date: 11/05/18 pH Meter ID: MLO2 Salinity Meter ID: ESI # 1
Initial: Br

Day 03 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	716	17.6	28	7.38
Comp R, S	31243-002	717	18.0	28	7.53
Comp U, S	31243-003	718	18.4	28	7.51
Comp D, S	31243-004	719	18.5	30	7.57
Comp T, B	31243-005	720	18.7	30	7.37
Comp CAD	31243-006	721	18.3	28	7.68

Date: 11/09/18 pH Meter ID: MLO2 Salinity Meter ID: ESI # 1
Initial: Br

Study: 31242

Client: AECOM

Project: New Haven

Day 04 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	722	20.7	30	7.40
Comp R, S	31243-002	723	20.1	32	7.48
Comp U, S	31243-003	724	20.1	30	7.42
Comp D, S	31243-004	725	20.1	30	7.48
Comp T, B	31243-005	726	20.2	32	7.38
Comp CAD	31243-006	727	20.4	30	7.58

Date: 11/10/18
Initial: BL

pH Meter ID: ML02
Salinity Meter ID: ESI #1

Day 05 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	728	20.5	30	7.33
Comp R, S	31243-002	729	19.5	30	7.38
Comp U, S	31243-003	730	19.5	30	7.43
Comp D, S	31243-004	731	19.5	30	7.43
Comp T, B	31243-005	732	19.5	30	7.38
Comp CAD	31243-006	733	19.0	31	7.57

Date: 11/11/18
Initial: MS

pH Meter ID: ML02
Salinity Meter ID: ESI #1

Study: 31242
Client: AECOM
Project: New Haven

Day 06 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp U,S	31243-102	734	18.4	30	7.36
Comp T, B	31243-104	735	18.4	30	7.35

Date: 11/12/18 pH Meter ID: MLOZ Salinity Meter ID: ESI#1
Initial: BG

Day 07 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp U, S	31243-102	736	17.8	28	7.29

Date: 11/13/18 pH Meter ID: ML0L Salinity Meter ID: ESI#1
Initial: BG

STUDY: 31243
 CLIENT: AECOM
 PROJECT: New Haven Harbor Supplemental 2018
 TASK: Ammonia Mitigation - Pore Water Summary
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and I
 Consistent with USEPA AWQC (1989) and Whitfield (1974).

Where: I = Ionic Strength (19.9273*N11)/(1000-1.005109*N11)

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.2

$F_{NH3} = \text{fraction of UIA } (+1/(1+10^{(R11+0.0324*(298-P11)+((0.0415^*1)/P11)-I$

Tot NH3 = total ammonia, or QLimit if ND

pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia					Sampled	Analyzed	L	M	N	O	P	Q	R	S
			Total	Qual	Unionized	QLimit	Units			temp (EC)	pH (SU)	salinity (ppt)	Tot NH3	Temp (EK)	I	pKa	F_{NH3}
Lab Day 01	24	31243-700	0.81		6.0E-06		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	19.3	4.37	31	0.81	292.45	0.64	9.319	7.4E-06
Lab Day 01	24	31243-708	0.78		9.4E-06		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	18.4	4.61	31	0.78	291.55	0.64	9.319	1.2E-05
Lab Day 02	48	31243-709	1.3		7.3E-06		0.5 mg/L as N	11/07/18 1100	11/09/18 1300	21.0	4.19	30	1.3	294.15	0.62	9.317	5.6E-06
Ref/CLDS Day 01	24	31243-701	2.3		0.0367		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.1	7.68	30	2.3	293.25	0.62	9.317	0.01594
Comp 001 (V, W)	24	31243-100	38		0.3361		0.2 mg/L as N	10/25/18 1000	10/25/18 1130	18.9	7.46	30	38	292.05	0.62	9.317	0.00885
Comp 001 (V, W)	48	31243-203	14		0.2371		0.5 mg/L as N	10/26/18 1000	10/26/18 1145	20.0	7.71	30	14	293.15	0.62	9.317	0.01694
Comp 001 (V, W)	72	31243-209	15		0.1406		0.1 mg/L as N	10/27/18 1350	10/28/18	20.3	7.44	30	15	293.45	0.62	9.317	0.00937
Comp 001 (V, W)	96	31243-215	7.8		0.0560		0.1 mg/L as N	10/28/18 1145	10/28/18	17.0	7.43	30	7.8	290.15	0.62	9.317	0.00718
Comp 001 (V, W)	120	31243-221	5.2		0.0387		0.2 mg/L as N	10/29/18 1130	10/29/18 1130	19.5	7.37	32	5.2	292.65	0.66	9.321	0.00744
Comp 001 (V, W)	24	31243-702	44		0.6405		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.1	7.64	30	44	293.25	0.62	9.317	0.01456
Comp 001 (V, W)	48	31243-710	25		0.3418		0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.58	30	25	294.25	0.62	9.317	0.01367
Comp 001 (V, W)	72	31243-716	11		0.0744		0.5 mg/L as N	11/09/18 1130	11/09/18 1300	17.6	7.38	28	11	290.75	0.57	9.312	0.00677
Comp 001 (V, W)	96	31243-722	6		0.0529		0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.7	7.40	30	6	293.85	0.62	9.317	0.00881
Comp 001 (V, W)	120	31243-728	6		0.0444		0.5 mg/L as N	11/11/18 1300	11/12/18 1100	20.5	7.33	30	6	293.65	0.62	9.317	0.0074
Comp 002 (R, S)	24	31243-101	27		0.3095		0.2 mg/L as N	10/25/18 1000	10/25/18 1130	18.4	7.59	30	27	291.55	0.62	9.317	0.01146
Comp 002 (R, S)	48	31243-204	15		0.2168		0.5 mg/L as N	10/26/18 1000	10/26/18 1145	20.0	7.64	30	15	293.15	0.62	9.317	0.01445
Comp 002 (R, S)	72	31243-210	16		0.1413		0.1 mg/L as N	10/27/18 1350	10/28/18	19.8	7.43	30	16	292.95	0.62	9.317	0.00883
Comp 002 (R, S)	96	31243-216	8.4		0.0520		0.1 mg/L as N	10/28/18 1145	10/28/18	17.0	7.37	32	8.4	290.15	0.66	9.321	0.00619
Comp 002 (R, S)	120	31243-222	7.3		0.0577		0.2 mg/L as N	10/29/18 1130	10/29/18 1130	19.7	7.39	32	7.3	292.85	0.66	9.321	0.00791
Comp 002 (R, S)	24	31243-600	33				0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data			33	#VALUE!	0	9.245	#VALUE!
Comp 002 (R, S)	48	31243-605	30		0.3575		0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.7	7.56	28	30	292.85	0.57	9.312	0.01192
Comp 002 (R, S)	48	31243-610	34		0.4765		0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.62	30	34	293.35	0.62	9.317	0.01401
Comp 002 (R, S)	24	31243-703	40		0.4608		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	19.7	7.55	30	40	292.85	0.62	9.317	0.01152
Comp 002 (R, S)	48	31243-711	25		0.3551		0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.0	7.60	30	25	294.15	0.62	9.317	0.0142
Comp 002 (R, S)	72	31243-717	12		0.1178		0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.0	7.53	28	12	291.15	0.57	9.312	0.00982
Comp 002 (R, S)	96	31243-723	8.7		0.0870		0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.1	7.48	32	8.7	293.25	0.66	9.321	0.01
Comp 002 (R, S)	120	31243-729	8		0.0616		0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.38	30	8	292.65	0.62	9.317	0.0077
Comp 003 (US-1, US-2)	24	31243-211	38		0.4108		0.2 mg/L as N	10/27/18 1350	10/28/18	21.0	7.48	30	38	294.15	0.62	9.317	0.01081
Comp 003 (US-1, US-2)	48	31243-217	22		0.1499		0.2 mg/L as N	10/28/18 1145	10/28/18	18.0	7.38	32	22	291.15	0.66	9.321	0.00682
Comp 003 (US-1, US-2)	72	31243-223	14		0.1250		0.2 mg/L as N	10/29/18 1130	10/29/18 1130	19.8	7.44	32	14	292.95	0.66	9.321	0.00893
Comp 003 (US-1, US-2)	96	31243-227	8		0.0409		0.2 mg/L as N	10/30/18 0915	10/30/18 1345	13.8	7.39	32	8	286.95	0.66	9.321	0.00511
Comp 003 (US-1, US-2)	24	31243-601	40				0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data			40	#VALUE!	0	9.245	#VALUE!
Comp 003 (US-1, US-2)	48	31243-606	40		0.3756		0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.4	7.47	30	40	292.55	0.62	9.317	0.00939
Comp 003 (US-1, US-2)	48	31243-611	40		0.5004		0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.57	30	40	293.35	0.62	9.317	0.01251
Comp 003 (US-1, US-2)	24	31243-704	51		0.6784		0.5 mg/L as N	11/07/18 1100	11/08/18 1030	19.8	7.61	30	51	292.95	0.62	9.317	0.0133
Comp 003 (US-1, US-2)	48	31243-712	32		0.4476		0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.59	30	32	294.25	0.62	9.317	0.01399
Comp 003 (US-1, US-2)	72	31243-718	21		0.2029		0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.4	7.51	28	21	291.55	0.57	9.312	0.00966
Comp 003 (US-1, US-2)	96	31243-724	11		0.0971		0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.1	7.42	30	11	293.25	0.62	9.317	0.00882
Comp 003 (US-1, US-2)	120	31243-730	14		0.1209		0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.43	30	14	292.65	0.62	9.317	0.00863
Comp 003 (US-1, US-2)	144	31243-734	10		0.0678		0.2 mg/L as N	11/12/18 1500	11/13/18 1100	18.4	7.36	30	10	291.55	0.62	9.317	0.00678
Comp 003 (US-1, US-2)	168	31243-736	4.6		0.0257		0.2 mg/L as N	11/13/18 1400	11/16/18 1330	17.8	7.29	28	4.6	290.95	0.57	9.312	0.00559
Comp 004 (DS-1, DS-2)	24	31243-212	31.8		0.4293		0.2 mg/L as N	10/27/18 1350	10/28/18	20.0	7.61	30	31.8	293.15	0.62	9.317	0.0135
Comp 004 (DS-1, DS-2)	48	31243-218	15		0.1542		0.1 mg/L as N	10/28/18 1145	10/28/18	18.0	7.56	32	15	291.15	0.66	9.321	0.01028

STUDY: 31243
 CLIENT: AECOM
 PROJECT: New Haven Harbor Supplemental 2018
 TASK: Ammonia Mitigation - Pore Water Summary
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and I
 Consistent with USEPA AWQC (1989) and Whitfield (1974).

Where: I = Ionic Strength $(19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.2

$F_{NH3} = \text{fraction of UIA} = (1 / (1 + 10^{(pKa - pH)})) \cdot (1 + 0.0324 \cdot (298 - P_{11})) + ((0.0415 \cdot P_{11}) - I)$

Tot NH3 = total ammonia, or QLimit if ND

pressure in FNH3 assumed to be 1 atm

Sample ID	Ammonia								L	M	N	O	P	Q	R	S	
	Hour	ESI Code	Total	Qual	Unionized	QLimit	Units	Sampled									Analyzed
Comp 004 (DS-1, DS-2)	72	31243-224	13		0.1372	0.2 mg/L as N	10/29/18 1130	10/29/18 1130	19.9	7.51		32	13	293.05	0.66	9.321	0.01055
Comp 004 (DS-1, DS-2)	96	31243-228	6.6		0.0465	0.2 mg/L as N	10/30/18 0915	10/30/18 1345	13.5	7.54		32	6.6	286.65	0.66	9.321	0.00704
Comp 004 (DS-1, DS-2)	24	31243-602	36			0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data				36	#VALUE!	0	9.245	#VALUE!
Comp 004 (DS-1, DS-2)	48	31243-607	40		0.5262	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.8	7.61		32	40	292.95	0.66	9.321	0.01315
Comp 004 (DS-1, DS-2)	48	31243-612	31		0.4546	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.64		30	31	293.35	0.62	9.317	0.01466
Comp 004 (DS-1, DS-2)	24	31243-705	48		0.7764	0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.3	7.68		30	48	293.45	0.62	9.317	0.01618
Comp 004 (DS-1, DS-2)	48	31243-713	32		0.5615	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.69		30	32	294.25	0.62	9.317	0.01755
Comp 004 (DS-1, DS-2)	72	31243-719	16		0.1766	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.5	7.57		30	16	291.65	0.62	9.317	0.01104
Comp 004 (DS-1, DS-2)	96	31243-725	8.4		0.0850	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.1	7.48		30	8.4	293.25	0.62	9.317	0.01012
Comp 004 (DS-1, DS-2)	120	31243-731	10		0.0863	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.43		30	10	292.65	0.62	9.317	0.00863
Comp 005 (TB-1, TB-2)	24	31243-205	31		0.5132	0.5 mg/L as N	10/25/18 1000	10/25/18 1130	20.0	7.70		30	31	293.15	0.62	9.317	0.01656
Comp 005 (TB-1, TB-2)	48	31243-213	18		0.1439	0.1 mg/L as N	10/27/18 1350	10/28/18	20.0	7.38		30	18	293.15	0.62	9.317	0.00799
Comp 005 (TB-1, TB-2)	72	31243-219	13		0.0917	0.1 mg/L as N	10/28/18 1145	10/28/18	18.0	7.39		30	13	291.15	0.62	9.317	0.00705
Comp 005 (TB-1, TB-2)	96	31243-225	13		0.0959	0.2 mg/L as N	10/29/18 1130	10/29/18 1130	20.0	7.35		32	13	293.15	0.66	9.321	0.00738
Comp 005 (TB-1, TB-2)	24	31243-603	45			0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data				45	#VALUE!	0	9.245	#VALUE!
Comp 005 (TB-1, TB-2)	48	31243-608	38		0.4866	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.9	7.59		30	38	293.05	0.62	9.317	0.0128
Comp 005 (TB-1, TB-2)	48	31243-613	40		0.5436	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.4	7.60		30	40	293.55	0.62	9.317	0.01359
Comp 005 (TB-1, TB-2)	24	31243-706	50		0.9907	1 mg/L as N	11/07/18 1100	11/08/18 1030	20.6	7.76		30	50	293.75	0.62	9.317	0.01981
Comp 005 (TB-1, TB-2)	48	31243-714	23		0.2983	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.0	7.56		30	23	294.15	0.62	9.317	0.01297
Comp 005 (TB-1, TB-2)	72	31243-720	9.5		0.0674	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.7	7.37		30	9.5	291.85	0.62	9.317	0.0071
Comp 005 (TB-1, TB-2)	96	31243-726	9.5		0.0762	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.2	7.38		32	9.5	293.35	0.66	9.321	0.00802
Comp 005 (TB-1, TB-2)	120	31243-732	12		0.0924	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.38		30	12	292.65	0.62	9.317	0.0077
Comp 005 (TB-1, TB-2)	144	31243-735	6.1		0.0404	0.2 mg/L as N	11/12/18 1500	11/13/18 1100	18.4	7.35		30	6.1	291.55	0.62	9.317	0.00663
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-102	12		0.3011	0.5 mg/L as N	10/26/18 1000	10/26/18 1145	18.9	7.92		30	12	292.05	0.62	9.317	0.02509
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-206	5.5		0.0760	0.5 mg/L as N	10/26/18 1000	10/26/18 1145	20.0	7.62		30	5.5	293.15	0.62	9.317	0.01381
Comp 006 (CAD-1, CAD-2, CAD-3)	72	31243-214	4.2		0.0590	0.1 mg/L as N	10/27/18 1350	10/28/18	20.0	7.63		31	4.2	293.15	0.64	9.319	0.01405
Comp 006 (CAD-1, CAD-2, CAD-3)	96	31243-220	3		0.0325	0.1 mg/L as N	10/28/18 1145	10/28/18	19.0	7.55		32	3	292.15	0.66	9.321	0.01082
Comp 006 (CAD-1, CAD-2, CAD-3)	120	31243-226	3		0.0374	0.2 mg/L as N	10/29/18 1130	10/29/18 1130	20.0	7.58		32	3	293.15	0.66	9.321	0.01247
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-604	13			0.1 mg/L as N	11/02/18 1250	11/02/18 1000	No data				13	#VALUE!	0	9.245	#VALUE!
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-609	14		0.2567	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.0	7.75		32	14	293.15	0.66	9.321	0.01833
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-614	18		0.3386	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.75		30	18	293.35	0.62	9.317	0.01881
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-707	16		0.2688	0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.2	7.70		30	16	293.35	0.62	9.317	0.0168
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-715	11		0.1974	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.70		30	11	294.25	0.62	9.317	0.01795
Comp 006 (CAD-1, CAD-2, CAD-3)	72	31243-721	6		0.0847	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.3	7.68		28	6	291.45	0.57	9.312	0.01412
Comp 006 (CAD-1, CAD-2, CAD-3)	96	31243-727	4.2		0.0545	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.4	7.58		30	4.2	293.55	0.62	9.317	0.01299
Comp 006 (CAD-1, CAD-2, CAD-3)	120	31243-733	3.5		0.0399	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.0	7.57		31	3.5	292.15	0.64	9.319	0.01139



Nancy Roka <nancy.roka@enthalpy.com>

RE: New Haven SPP Effort & Milford 28-Day Studies

Van Naerssen, Kris <Kris.VanNaerssen@aecom.com>

Thu, Nov 15, 2018 at 11:10 PM

To: James Provencher <james.provencher@enthalpy.com>, Kirk Cram <kirk.cram@enthalpy.com>, "Surprenant, Maura" <Maura.Surprenant@aecom.com>

Cc: "Archer, Christine" <Christine.Archer@aecom.com>, Nancy Roka <nroka@envirosystems.com>

Thanks much Jim –

Will include this COC in our submittal to NAE.

Please note that I connected with Ben tonight – please do plan to proceed as noted below:

- Use of the provided NHH waters to create the elutriates for the SPP re-dos
- Use of the New Hampshire lab water as their dilutant

Thanks much & let us know if any additional questions or concerns.

Best, Kris

From: James Provencher [mailto:james.provencher@enthalpy.com]

Sent: Thursday, November 15, 2018 3:50 PM

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ELUTRIATE PREPARATION SUMMARY

Date: 10/25/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	<u>Composite 1 Elutriate</u>	Time Mixing Started	<u>1140</u>
Amount of Sediment	<u>13L</u>	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No <input type="radio"/>
Amount of Overlying	<u>52L</u>	Time Mixing Stopped	<u>1210</u>
		Time Elutriate Siphoned Off	<u>1310</u>
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>BG/</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 1 Elutriate	31246-101	31243-100 31242 Corp V/W	31243-100 -	Corp V/W	31242-018

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 35 L ¹²¹ _{WNS}
31248	SPP Assays	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/25/18

ESI Study: 31242

Client:

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	<u>Composite 2 Elutriate</u>	Time Mixing Started	1235/1530
Amount of Sediment	<u>6.5/12 L</u>	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	<u>26/48 L</u>	Time Mixing Stopped	<u>1305/1600</u>
		Time Elutriate Siphoned Off	<u>1405/1700</u>
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>BK</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 2 Elutriate	31246-103	Comp R, S	31243-101	Comp R, S	31242-022

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 21 L ³⁵ _{10/25/18}
31248	SPP Assays	~ 6 L

NOTES:

ELUTRIATE PREPARATION SUMMARY

Date: 10/26/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 3 Elutriate		Time Mixing Started <u>1445 / 1640</u>
Amount of Sediment	<u>5.5 / 13</u> L	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No <input type="radio"/>
Amount of Overlying	<u>22 / 52</u> L	Time Mixing Stopped	<u>1515 / 1710</u>
		Time Elutriate Siphoned Off	<u>1615 / 1810</u>
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>TH</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 3 Elutriate	31246-105	Comp U, S	31243-102	Comp U, S	31242-014

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 35 L
31248	SPP Assays	~ 6 L

NOTES:

ELUTRIATE PREPARATION SUMMARY

Date: 10/25/18 ^{6:00 PM 10/26}

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	<u>Composite 4 Elutriate</u>	Time Mixing Started	<u>1140</u>
Amount of Sediment	<u>12.15 L</u> ^{10/25}	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No <input type="radio"/>
Amount of Overlying	<u>48.54 L</u>	Time Mixing Stopped	<u>1210</u>
		Time Elutriate Siphoned Off	<u>1310</u>
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>JK</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 4 Elutriate	31246-107	Comp D ₁₅	31243-103	Comp(D ₁₅)	31242-015

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 21 L
31248	SPP Assays	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/26/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 5 Elutriate	Time Mixing Started	1855 @ 10/26/18
Amount of Sediment	13 L	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	52 L	Time Mixing Stopped	1825
		Time Elutriate Siphoned Off	1825 @ 10/26/18
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	JBL		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 5 Elutriate	31246-109	Comp T/B	31243-104	Comp T/B	31242-016

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 21 L
31248	SPP Assays	~ 6 L

NOTES:

ELUTRIATE PREPARATION SUMMARY

Date: 07/25/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	Composite 6 Elutriate	Time Mixing Started	<u>1350</u>
Amount of Sediment	<u>13 L</u>	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Amount of Overlying	<u>52 L</u>	Time Mixing Stopped	<u>1420</u>
		Time Elutriate Siphoned Off	<u>1520</u>
		Centrifuged?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Preparer's Initials	<u>TSG</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 6 Elutriate	31246-111	<u>Comp CAD 1,4,3</u>	31243-105	<u>Comp CAD 1,4,3</u>	31242-017

Subsamples Removed

Lab Code	Elutriate Use	Volume
Alpha	Chemical Elutriate Analysis	~ 21 L
31248	SPP Assays	~ 6 L

NOTES:

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 1 Elutriate	Time Mixing Started	0910
Amount of Sediment	3	L Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	12	L Time Mixing Stopped	0940
		Time Elutriate Siphoned Off	1040
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	MS		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 1 Elutriate	31246-112	Composite 1	31243-100	Comp V,W	018 31242-017 <small>MS 12/19/18</small>

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 2 Elutriate	Time Mixing Started	0910
Amount of Sediment	3	L Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	12	L Time Mixing Stopped	0940
		Time Elutriate Siphoned Off	1040
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	MS		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 2 Elutriate	31246-113	Composite 2	31243-101	Comp R,S	31242-018 <small>BY 11/27 622</small>

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 3 Elutriate	Time Mixing Started	1120 1120
Amount of Sediment	3	L Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	12	L Time Mixing Stopped	1150
		Time Elutriate Siphoned Off	1250
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>MS</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 3 Elutriate	31246-114	Composite 3	31243-102	Comp US 1-2	31242-014

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES		TIMES	
Sample ID	<u>Composite 4 Elutriate</u>	Time Mixing Started	<u>1120</u>
Amount of Sediment	<u>3</u> L	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	<u>12</u> L	Time Mixing Stopped	<u>1150</u>
		Time Elutriate Siphoned Off	<u>1250</u>
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>BC</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 4 Elutriate	31246-115	Composite 4	31243-103	Comp DS 1-2	31242-015

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 5 Elutriate	Time Mixing Started	0955
Amount of Sediment	3	L Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	12	L Time Mixing Stopped	1025
		Time Elutriate Siphoned Off	1125
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	MS		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 5 Elutriate	31246-116	Composite 5	31243-104	Comp TB 1-2	31242-016

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 10/31/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 6 Elutriate	Time Mixing Started	0955
Amount of Sediment	3 L	Hand Mixed Every 10 Minutes?	Yes <input type="radio"/> No <input checked="" type="radio"/>
Amount of Overlying	12 L	Time Mixing Stopped	1025
		Time Elutriate Siphoned Off	1125
		Centrifuged?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Preparer's Initials	<u>Bl</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 6 Elutriate	31246-117	Composite 6	31243-105	Comp CAD 1,2,3	31242-017

Subsamples Removed

Lab Code	Elutriate Use	Volume
31291	SPP - Ammonia Mitigated	~ 6 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES		TIMES
Sample ID	Composite 1 Elutriate	Time Mixing Started	0730
Amount of Sediment	1 L	Hand Mixed Every 10 Minutes?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Amount of Overlying	4 L	Time Mixing Stopped	0800
		Time Elutriate Siphoned Off	0900
		Centrifuged?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Preparer's Initials	BG		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 1 Elutriate	31246-118	Comp VW	31243-100	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~2 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	<u>Composite 2 Elutriate</u>	Time Mixing Started	<u>0730</u>
Amount of Sediment	<u>1 L</u>	Hand Mixed Every 10 Minutes?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Amount of Overlying	<u>4 L</u>	Time Mixing Stopped	<u>0800</u>
		Time Elutriate Siphoned Off	<u>0900</u>
		Centrifuged?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Preparer's Initials	<u>Bb</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 2 Elutriate	31246-119	Comp R, S	31243-101	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~2 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	Composite 3 Elutriate	Time Mixing Started	0809
Amount of Sediment	1 L	Hand Mixed Every 10 Minutes?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Amount of Overlying	4 L	Time Mixing Stopped	0839
		Time Elutriate Siphoned Off	0939
		Centrifuged?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Preparer's Initials PL

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 3 Elutriate	31246-120	Comp 4, S	31243-102	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~ 2 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

	VOLUMES	TIMES	
Sample ID	Composite 4 Elutriate	Time Mixing Started	0809
Amount of Sediment	1 L	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	4 L	Time Mixing Stopped	0839
		Time Elutriate Siphoned Off	0939
		Centrifuged?	Yes <input checked="" type="radio"/> No
Preparer's Initials	<u>BC</u>		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 4 Elutriate	31246-121	Comp D, S	31243-103	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~2 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	Composite 5 Elutriate	Time Mixing Started	0900
Amount of Sediment	1 L	Hand Mixed Every 10 Minutes?	Yes <input checked="" type="radio"/> No
Amount of Overlying	4 L	Time Mixing Stopped	0930
		Time Elutriate Siphoned Off	1030
		Centrifuged?	Yes <input checked="" type="radio"/> No
Preparer's Initials	BS		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 5 Elutriate	31246-122	Comp T, B	31243-104	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~ 2 L

NOTES: _____

ELUTRIATE PREPARATION SUMMARY

Date: 11/21/18

ESI Study: 31242

Client: AECOM

Project: New Haven Harbor

VOLUMES

TIMES

Sample ID	Composite 6 Elutriate	Time Mixing Started	0900
Amount of Sediment	1 L	Hand Mixed Every 10 Minutes?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Amount of Overlying	4 L	Time Mixing Stopped	0930
		Time Elutriate Siphoned Off	1030
		Centrifuged?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Preparer's Initials	BG		

Elutriate ID	ESI Elutriate Code	Sediment ID	ESI Sediment Code	Overlying Water ID	ESI Overlying Water Code
Composite 6 Elutriate	31246-123	Comp CAD/183	31243-105	New Haven	31242-021

Subsamples Removed

Lab Code	Elutriate Use	Volume
	A.p. SPP Repeat	~ 2 L

NOTES: _____

Americamysis bahia
Suspended Particulate Phase

Bench Sheets

Unmitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31248	Incubator ID:	112 0
Project:	New Haven	Client:	AECOM

Composites 1, 2, & 6

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input checked="" type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt (E) NR 11/21/18	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C (E) NR 11/21/18
pH: 7.8 ± 0.5	Photoperiod: 16 hour light, 8 hour dark

Test Chamber	Solution Volume
(Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL Tumbler (P)	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____

Replicate Information

<i>A. bahia</i> and <i>M. beryllina</i> : • 5 Reps per treatment • 10 organisms per chamber	<i>Arbacia</i> : • 5 Reps per treatment • 20-30 embryos/mL
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Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)

Feeding

<i>A. bahia</i> : Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i> : Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i> : NONE	

Date: 10/25/18

Initial GRS



03ABAR0102418

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species AMERICAMYSIS bahia

Source: Lab reared Hatchery reared Field collected

Hatch date 10-21-18 Receipt date

Lot number 102118MS Strain

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. ppm

pH 7.8 su Hardness ppm Alkalinity ppm

III. Culture Conditions

Freshwater Saltwater Other

Recirculating Flow through Static renewal

DIET: Flake food Phytoplankton Trout chow

Artemia Rotifers YCT Other ENCAP. SHRIMP DIET

Prophylactic treatments:

Comments:

IV. Shipping Information

Client: EST # of Organisms 2800+

Carrier: Date shipped 10-24-18

Biologist: Mark Desautels

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31248 CLIENT: AECOM DILUENT: CLDS
 SPECIES: A.bahia and M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: CLDS		Composite #: comp1		Composite #: comp2		Composite #: comp6		
Concentration	Elutriate ID: 31242-009	Final Vol (mL)	Elutriate ID: 31246-101	Final Vol (mL)	Elutriate ID: 31246-102 <i>Case No 103</i>	Final Vol (mL)	Elutriate ID: 31246-111	Final Vol (mL)	
	Vol Eff (mL)		Vol Eff (mL)		Vol Eff (mL)		Vol Eff (mL)		
Lab	/		0	2,000	0	2,000	0	2,000	
(RW)			0	↓	0	↓	0	↓	
1 %				20		20		200	
10 %				200		200		200	
50 %				1,000		1,000		1,000	
100 %				2,000	↓	2,000	↓	2,000	↓
Initial Date Time	/		MW		MW		LAG		
			10/25/18		10/25/18		10/25/18		
			1505		1550		1655		
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		
Initial Salinity (ppt)	27.4		24.9		24.8		24.2		
Vol of Elutriate (mL)	50,000		8,000		8,000		5,500		
Grams of Salt (g)	149.8		47.0		47.9		36.7		
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117		
Final Salinity	27.9		28.1		27.9		29.9		
Date & Initial	10/25/18 MW		10/25/18 MW		10/25/18 MW		10/25/18 CFS		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:** 182
Test Species: *Americamysis bahia* **Lot ID:** 03ABARO102418 **Sample:** Controls **Diluent:** CLDS

SURVIVAL - Controls

Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB control water)	A	10	10	10	10	10	10	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	10		B	10	10	10	10	10	10
	C	10	10	10	10	10	10		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	10
	E	10	10	10	10	10	10		E	10	10	10	10	10	10
Initials		MW	MT	GRS	CFS	LAG	GRS	Comments:							
Date		10/25/18	10/25	10/26/18	10/27	10/28	10/29/18								
Time		1645	1730	1625	1450	1525	1600								

@CFS 10/27

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
@GRS 10/30 200-264 213	@GRS 10/30 246-247 260-261
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)										
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96						
LAB	A	7.7	8.0	7.1	7.1	6.7	7.96	7.91	7.89	7.90	7.76	20	20	19	19	19	31	32	32	34	31	/	/	/	/	31	/					
(RW)	A	8.5	7.7	7.0	6.8	6.3	7.91	7.98	7.89	7.85	7.74	20	20	19	19	19	29	29	30	31	32	/	/	/	/	/						
Initials	MT	MW	LAG	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2											
Date	10/25	10/26	10/27	10/28	10/29	Exposure (Hours)										DO Meter #	MLO2					DO Meter #	MLO1									
Time	1515	0935	1345	1345	1505						0	24	48	72	96	DO Probe #	160					DO Probe #	96									
Incub. Temp	21	21	21	21	21						1	1	2	1	1	pH Meter #	MLO2					pH Meter #	MLO1									
FEEDING: <i>Artemia nauplii</i> (A-5179)											Thermometer or Probe #					MLO2	MLO2	MLO1	MLO2	MLO2	pH Probe #					163	pH Probe #					158
Fed By:	MT	GRS	LAG	LAG	/	Initial					MT	MW	LAG	CFS	MT	Salinity Meter #					MLO2	Salinity Meter #					MLO1					

CFS

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:** 1 & 2
Test Species: *Americamysis bahia* **Lot ID:** 03ABAR0102418 **Sample:** Composite #1 **Diluent:** CLDS

SURVIVAL - Composite #1 (E3) M2 11/21/18

Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	42	72	96
1 %	A	10	10	10	10	10	10	50 %	A	10	10	10	10	10	10
	B	10	10	10	9	9	9		B	10	10	10	10	10	10
	C	10	10	10	10	10	10		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	10
	E	10	10	10	10	10	10		E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10	100 %	A	10	10	10	10	10	6
	B	10	10	10	10	10	10		B	10	10	11	10	10	9
	C	10	10	10	10	10	10		C	10	10	10	10	10	7
	D	10	10	10	10	10	10		D	10	10	11	11	9	8
	E	10	10	10	10	10	10		E	10	10	10	9	9	9

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
201-204	248-251 262-265
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Initials	MW	MT	GRS	CFS	LAG	MS
Date	10/25/18	10/25	10/24/18	10/27	10/28	10/29/18
Time	1650	1730	1635	1455	1535	1600

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.1	7.3	7.1	6.6	5.8	7.91	8.00	7.93	7.84	7.65	20	20	20	18	19	29	29	30	31	32						
10 %	A	8.2	6.9	6.9	6.7	5.5	7.88	7.99	7.95	7.97	7.84	20	20	20	18	19	29	29	30	31	32						
50 %	A	8.1	7.1	6.8	6.5	5.9	7.82	8.10	8.08	8.17	8.13	20	20	19	18	19	29	29	30	31	32						
100 %	A	6.7	6.9	6.7	6.4	5.9	7.68	8.09	8.15	8.29	8.30	20	20	19	18	19	29	29	30	31	32						

Initials	MT	MW	LAG	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date	10/25	10/26	10/27	10/28	10/29	Exposure (Hours)										DO Meter #		ML02			DO Meter #		ML01		
Time	1515	0940	1400	1350	1505						0	24	48	72	96	DO Probe #		160			DO Probe #		96		
Incub. Temp	21	21	21	21	21	Water Quality Station #					1	1	2	1	1	pH Meter #		ML02			pH Meter #		ML01		
FEEDING: <i>Artemia nauplii</i> (A-5179)						Thermometer or Probe #					ML02	ML02	ML01	ML02	ML02	pH Probe #		163			pH Probe #		158		
Fed By:	MT	GRS	LAG	LAG		Initial					MT	MW	LAG	CFS	MT	Salinity Meter #		ML02			Salinity Meter #		ML01		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:** 1 & 2
Test Species: *Americamysis bahia* **Lot ID:** 03A6AR0102418 **Sample:** Composite #2 **Diluent:** CLDS

SURVIVAL - Composite #1^(ES) 10/21/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		MW	MT	GRS	CFS	LAG	GRS
Date		10/25/18	10/25	10/27	10/28	10/29/18	
Time		1655	1730	1700	1605	1545	1605

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
205-208	252-255 266-269
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.1	7.0	6.4	6.8	6.5	7.87	7.96	7.87	7.83	7.82	20	20	19	19	19	29	30	30	31	31						
10 %	A	8.2	7.1	6.8	6.8	6.5	7.84	8.01	7.95	7.95	7.95	19	20	19	19	19	29	30	30	31	31						
50 %	A	7.5	6.8	6.7	6.8	6.7	7.74	8.03	8.08	8.18	8.20	18	20	19	19	19	29	29	30	31	31						
100 %	A	8.0	6.9	6.7	7.2	6.7	7.78	8.08	8.14	8.30	8.34	19	20	20	19	19	29	29	30	31	31						

Initials		RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2				
Date		Exposure (Hours)					DO Meter #					DO Meter #				
Time							DO Probe #					DO Probe #				
Incub. Temp		Water Quality Station #					pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)		Thermometer or Probe #					pH Probe #					pH Probe #				
Fed By:		Initial					Salinity Meter #					Salinity Meter #				

Ⓢ Rep C in the 100% concentration was dropped into during the test process by the incubator the test was stand in.

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:** 1 & 2
Test Species: *Amencamysis habia* **Lot ID:** 03 ABARO102418 **Sample:** Composite #6 **Diluent:** CLDS

SURVIVAL - Composite #1 (E) 11/21/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	16	10
	B	10	10	10	10	16	10
	C	10	10	10	10	16	10
	D	10	10	10	10	16	10
	E	10	10	10	10	16	10
10 %	A	10	10	10	9	9	9
	B	10	10	10	10	16	10
	C	10	10	10	10	16	10
	D	10	10	10	10	16	10
	E	10	10	10	10	16	10
Initials		MW	MT	GRS	CFS	LAG	MS
Date		10/25/18	10/25	10/26/18	10/27	10/28	10/29
Time		1710	1730	1720	1610	1555	165

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	11	11	11
	B	10	10	10	10	16	10
	C	10	10	10	10	16	10
	D	10	10	10	10	16	10
	E	10	10	10	10	16	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10

(E) NR 11/21/18

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
209 - 212	270 - 273
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:
 (E) NR 11/21/18 11 orgs used from start in starts

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.1	7.1	7.1	6.9	6.5	7.85	8.03	7.88	7.89	7.80	21	20	19	19	19	29	30	31	32	32	/	/	/	/	/
10 %	A	8.1	7.2	6.9	6.7	6.4	7.88	8.04	7.94	7.91	7.80	21	20	19	19	19	29	30	30	31	32	/	/	/	/	/
50 %	A	7.9	7.1	6.9	6.7	6.7	7.95	8.11	8.08	8.10	8.07	20	20	19	19	19	30	30	31	32	33	/	/	/	/	/
100 %	A	7.4	7.1	6.9	6.8	6.5	7.97	8.15	8.15	8.25	8.25	20	20	19	19	19	31	31	32	33	31	/	/	/	31	/

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2											
				Exposure (Hours)					DO Meter #					DO Meter #											
MT MW LAG CFS MT	10/25 10/26 10/27 10/28 10/29	1610 0955 1435 1415 1505	21 21 21 21 21	0	24	48	72	96	1	1	2	1	1	ML02	ML01	ML02	ML01	ML02	ML01	ML02	ML01	ML02	ML01	ML02	ML01
FEEDING: <i>Artemia nauplii</i> (A-5179)				Thermometer or Probe #					pH Meter #					pH Probe #											
Fed By:	MT GRS LAG	Initial					pH Probe #					Salinity Meter #													
		MT MW LAG CFS MT					163					ML02													

CFS

Assay Review Checklist

DATE IN: 10/25/18
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: AB96 SPP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/25/18	MT	
Day 1	10/26/18	GRS	
Day 2	10/27	CFS	
Day 3	10/28	LAG	
Day 4	10/29/18	MS	
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	11/16/18	JTP	
Sample Receipt Complete	11/16/18	↓	
Organism Culture Sheet(s)	10/30/18	GRS	
Bench Sheets Complete (dates, times, initials, etc...)	10/30/18	GRS	
Water Quality Data Complete	↓	↓	
TRC Values & Bottle Numbers	↓	↓	
Daphnid Calculations Complete	N/A	N/A	
Weights Reported	N/A	N/A	
Assay Acceptability Review	10/30/18	GRS	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/2/18	NR	
Statistical Analysis Reviewed	11/6/18	LF	
Data Acceptability Review	11/6/18	NR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LABFORMS\ Assay Review Checklist.wpd

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY			
Study #:	31248	Incubator ID:	2 10
Project:	New Haven	Client:	AECOM
Composites 3, 4 & 5			
Summary of Test Conditions			
Exposure		Species Used	
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours		(Check box for all that apply) <input checked="" type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)	
Water Quality Parameters			
Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt (E3) NR 11/2/18		Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C (E3) NR 11/2/18	
pH: 7.8 ± 0.5		Photoperiod: 16 hour light, 8 hour dark	
Test Chamber		Solution Volume	
(Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL Tumbler/Beaker		(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____	
Replicate Information			
<i>A. bahia</i> and <i>M. beryllina</i> : • 5 Reps per treatment • 10 organisms per chamber		<i>Arbacia</i> : • 5 Reps per treatment • 20-30 embryos/mL	
Cleaning		Treatments	
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).		Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)	
Feeding			
<i>A. bahia</i> : Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day		<i>M. beryllina</i> : Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day	
<i>Arbacia</i> : NONE			
Date: 10/26/18		Initial: BK	



03ABAR0102418

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species AMERICAMYSIS bahia

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10-21-18 Receipt date _____

Lot number 102118MS Strain _____

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity ~28 ppt D.O. _____ ppm

pH 7-8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers _____ YCT _____ Other FW exp. Shrimp Diet

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: EST # of Organisms 2800+

Carrier: _____ Date shipped 10-24-18

Biologist: Mark Desautels

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31248 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina & A. bahia TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 3		Composite #: 4		Composite #: 5		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	2,000	0	2,000	0	2,000		
(RW)	0		0		0			
1 %	20		20		20			
10 %	200		200		200			
50 %	1,000		1,000		1,000			
100 %	2,000	✓	2,000	✓	2,000	✓		
Initial	CFS		CFS		CFS			
Date	10/26/18		10/26/18		10/26/18			
Time	1735		1645		1710			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Reference Site Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.5		24.2		24.4		27.6	
Vol of Elutriate (mL)	5,340		4,290		4,000			
Grams of Salt (g)	21.5		18.8g		16.6g		-	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	28.9		28.2		28.7		27.6	
Date & Initial	10/26/18	CFS	10/26/18	CFS	10/26/18	MW	10/26/18	CFS

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *A. baebia* **Lot ID:** 03ABARD102418 **Sample:** Controls **Diluent:** CLDS
Menidia beryllina
LCI 10/22/18

SURVIVAL - Controls - beakers

Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB control water)	A	10	10	10	10	10	10	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	10		B	10	10	10	10	10	10
	C	10	10	10	10	10	10		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	10
	E	10	10	10	10	10	10		E	10	10	10	10	10	10
Initials		CFS	MW	GRS	GRS	MS	MS	Comments:							
Date		10/21/18	10/24/18	10/27/18	10/28/18	10/29/18	10/30/18								
Time		1815	1920	1650	1700	1650	1615								

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
-226 -227	316-317

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
LAB	A	8.8	7.1	6.9	6.2	5.9	7.95	7.92	7.87	7.84	7.73	21.0	20	18	19	19	30.4	32	32	33	33	/	/	/	/	/	12/11
(RW)	A	7.1	6.3	7.0	6.6	5.9	7.87	7.78	7.85	7.76	7.69	20.0	20	18	19	19	27.6	29	30	30	30	/	/	/	/	/	
Initials		LCI	LCI	CFS	MT	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2					
Date		10/26	10/27	10/28	10/29	10/30	Exposure (Hours)										DO Meter #					DO Meter #					
Time		1640	1345	1530	1540	1205											DO Probe #					DO Probe #					
Incub. Temp		21	21	21	21	21	Water Quality Station #					pH Meter #					pH Meter #										
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #					pH Probe #					pH Probe #										
Fed By:		MW	GRS	GRS	MS	Initial					Salinity Meter #					Salinity Meter #											

12/11/18 (10) Salinity not modified

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis bahia* **Lot ID:** 0346AR0102418 **Sample:** Composite #3 **Diluent:** CLDS

SURVIVAL - Composite #1 (M) NR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	9	9
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		CFS	MW	GRS	GRS	MS	MS
Date		10/26/18	10/26/18	10/27/18	10/27/18	10/29/18	10/30/18
Time		1845	1933	1710	1715	1700	1650

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
228-231	318-321
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.8	7.4	7.3	7.0	6.8	7.86	7.92	7.87	7.85	7.84	19.5	19	17	19	19	28.28	29	29	30	30	/	/	/	/	/
10 %	A	9.7	7.2	7.3	6.5	6.6	7.83	7.97	7.96	7.93	7.95	19.9	19	17	19	19	30.28	29	30	30	31	/	/	/	/	/
50 %	A	9.4	7.2	7.4	6.4	6.2	7.74	8.01	8.16	8.19	8.20	20.0	19	17	19	19	30.28	30	30	31	31	/	/	/	/	/
100 %	A	8.6	7.1	7.3	6.6	6.0	7.70	8.05	8.24	8.30	8.32	19.8	19	17	19	19	30.28	31	32	32	32	/	/	/	/	/

Initials		RECORD OF METERS USED					Water Quality Station #1		Water Quality Station #2		
Date		Exposure (Hours)					DO Meter #	MLO2	DO Meter #	MLO1	
Time							DO Probe #	160	DO Probe #	96	
Incub. Temp		Water Quality Station #	2	1	1	1	pH Meter #	MLO2	pH Meter #	MLO1	
		Thermometer or Probe #	159	1	1	MLO2	MLO2	pH Probe #	163	pH Probe #	158
		Initial	LCI	LCI	CFS	MT	MT	Salinity Meter #	MLO2	Salinity Meter #	MLO1

FEEDING: *Artemia nauplii* (A-5179)
Fed By: MW GRS GRS MS

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31248	Project:	New Haven	Client:	AECOM	Incubator ID:	
Test Species:	<i>Americamysis bahia</i>	Lot ID:	03ABAR0102418	Sample:	Composite #4	Diluent:	CLDS

SURVIVAL - Composite #1 - (E3) NR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		CFS	MW	GRS	GRS	MS	MS
Date		10/20/18	10/26/18	10/27/18	10/28/18	10/29/18	10/30/18
Time		1855	1940	1725	1730	1710	1700

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	8	6
	B	10	10	10	10	10	7
	C	10	10	10	10	8	8
	D	10	10	10	10	10	7
	E	10	10	10	8	6	5

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
232-235	322-325
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.8	7.6	7.4	7.0	6.9	7.82	7.93	7.95	7.87	7.87	18.2	19	17	19	19	27.5	29	29	30	30	/	/	/	/	/
10 %	A	9.7	7.4	7.4	6.9	6.5	7.87	8.00	8.02	7.98	7.95	19.1	20	17	19	19	28.0	29	30	30	31	/	/	/	/	/
50 %	A	9.3	7.2	7.3	6.8	6.5	7.80	8.05	8.18	8.22	8.22	19.5	19	17	19	19	28.1	30	30	30	31	/	/	/	/	/
100 %	A	8.7	6.9	7.3	6.6	6.5	7.77	8.08	8.26	8.32	8.34	19.9	19	17	19	19	28.2	30	30	31	31	/	/	/	/	/

Initials		LCI	LCI	CFS	MT	MT	RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2				
Date		10/26	10/27	10/28	10/29	10/30	Exposure (Hours)					DO Meter #		MLO2	DO Meter #		MLO1				
Time		1705	1505	1545	1540	1205						DO Probe #		160	DO Probe #		96				
Incub. Temp		21	21	21	21	21	Water Quality Station #		2	1	1	1	1	pH Meter #		MLO2	pH Meter #		MLO1		
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #		159	1	1	MLO2	MLO2	pH Probe #		163	pH Probe #		158		
Fed By:		MW	GRS	GRS	MS		Initial		LCI	LCI	CFS	MT	MT	Salinity Meter #		MLO2	Salinity Meter #		MLO1		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis bahia* **Lot ID:** 03ABARO102418 **Sample:** Composite #5 **Diluent:** CLDS

SURVIVAL - Composite #1 (3) NR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	9	9
Initials		CFS	MW	GRS	MS	MS	MS
Date		10/26/18	10/26/18	10/27/18	10/27/18	10/29/18	10/30/18
Time		1910	1945	1745	1730	1720	1710

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
236-239	326-329
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt = 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.6	7.2	7.3	7.0	6.6	7.89	7.91	7.93	7.86	7.80	19.1	19	17	19	19	27.8	30	30	30	31	/	/	/	/	/
10 %	A	9.6	7.1	7.1	6.8	6.2	7.82	7.95	7.98	7.98	7.92	19.2	19	17	19	18	28.0	30	30	31	31	/	/	/	/	/
50 %	A	9.0	7.1	6.9	6.5	6.2	7.64	8.01	8.17	8.20	8.22	19.3	19	17	19	18	28.3	30	30	31	31	/	/	/	/	/
100 %	A	8.5	6.8	6.8	6.6	6.2	7.62	8.04	8.25	8.30	8.33	19.3	19	17	19	19	28.7	30	31	32	32	/	/	/	/	/

RECORD OF METERS USED						Water Quality Station #1				Water Quality Station #2					
Initials	LCI	LCI	CFS	MT	MT	Exposure (Hours)				DO Meter #	MLO2	DO Meter #	MLO1		
Date	10/26	10/27	10/28	10/29	10/30	0	24	48	72	96	DO Probe #	160	DO Probe #	96	
Time	1715	1430	1540	1540	1205	Water Quality Station #	2	1	1	1	1	pH Meter #	MLO2	pH Meter #	MLO1
Incub. Temp	21	21	21	21	21	Thermometer or Probe #	159	1	1	MLO2	MLO2	pH Probe #	163	pH Probe #	158
FEEDING: <i>Artemia nauplii</i> (A-5179)						Initial	LCI	LCI	CFS	MT	MT	Salinity Meter #	MLO2	Salinity Meter #	MLO1
Fed By:	MW	GRS	MS	MS	/										

Assay Review Checklist

DATE IN: 10/26/18
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: NHH-2018
 ASSAY: A696SPP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/26/18	MW	
Day 1	10/27/18	GRS	
Day 2	10/28/18	MS	
Day 3	10/29/18	MS	
Day 4	10/30/18	MS	
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/2/18	NR	
Statistical Analysis Reviewed	11/6/18	LF	
Data Acceptability Review	11/6/18	NR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

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Americamysis bahia
Suspended Particulate Phase
Statistical Analysis Reports
Survival
Unmitigated Assays

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:09 (p 1 of 1)
Test Code/ID: 03-6925-9825/31248Ab-Comp1

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	25 Oct-18 16:45	Species:	Americamysis bahia	Sample Code:	31246-101						
End Date:	29 Oct-18 16:00	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	25 Oct-18 13:10	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V',W')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				10			
0	LS	2	12	10				10			
0	LS	3	13	10				10			
0	LS	4	22	10				10			
0	LS	5	27	10				10			
0	R	1	4	10				10			
0	R	2	8	10				10			
0	R	3	18	10				10			
0	R	4	20	10				10			
0	R	5	29	10				10			
1		1	5	10				10			
1		2	9	10				9			
1		3	17	10				10			
1		4	24	10				10			
1		5	30	10				10			
10		1	1	10				10			
10		2	11	10				10			
10		3	15	10				10			
10		4	21	10				10			
10		5	25	10				10			
50		1	2	10				10			
50		2	7	10				10			
50		3	16	10				10			
50		4	23	10				10			
50		5	28	10				10			
100		1	6	10				6			
100		2	10	10				9			
100		3	14	10				7			
100		4	19	10				8			
100		5	26	10				9			

CETIS Summary Report

Report Date: 07 Nov-18 14:09 (p 1 of 1)
Test Code: 31248Ab-Comp1 | 03-6925-9825

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5537-8861	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 25 Oct-18 16:45	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 29 Oct-18 16:00	Species: Americamysis bahia	Brine: Not Applicable
Duration: 95h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 10-9651-6502	Code: 31246-101	Client: AECOM
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
11-3830-8362	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
13-2569-7197	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.780	0.618	0.942	0.600	0.900	0.058	0.130	16.72%	22.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	0.900	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		0.600	0.900	0.700	0.800	0.900

CETIS Analytical Report

Report Date: 07 Nov-18 14:09 (p 1 of 2)
Test Code: 31248Ab-Comp1 | 03-6925-9825

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 11-3830-8362		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:40		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 10-9651-6502		Code: 31246-101			Client: AECOM							
Sample Date: 25 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 13:10		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1507163	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.94	2.82	0.0290	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%	
100		5	0.780	0.600	0.900	0.130	16.70%	22.0%	39/50	0.78	22.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	0.900	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		0.600	0.900	0.700	0.800	0.900						

CETIS Analytical Report

Report Date: 07 Nov-18 14:09 (p 2 of 2)
Test Code: 31248Ab-Comp1 | 03-6925-9825

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Analysis ID: 13-2569-7197	Endpoint: 96h Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 9:40	Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Sample ID: 10-9651-6502	Code: 31246-101	Client: AECOM		Project: Dredged Sediment Evaluation							
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution										
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	2056829	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
96h Proportion Survived Summary				Calculated Variate(A/B)					Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
100		4	0.825	0.700	0.900	0.096	11.60%	17.5%	33/40	0.825	17.5%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	0.900	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		Outlier	0.900	0.700	0.800	0.900					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:09 (p 1 of 1)
Test Code/ID: 02-4816-7480/31248Ab-Comp2

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	25 Oct-18 16:45	Species:	Americamysis bahia	Sample Code:	31246-103						
End Date:	29 Oct-18 16:00	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	25 Oct-18 14:05	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				10			
0	LS	2	7	10				10			
0	LS	3	13	10				10			
0	LS	4	23	10				10			
0	LS	5	28	10				10			
0	R	1	4	10				10			
0	R	2	10	10				10			
0	R	3	18	10				10			
0	R	4	19	10				10			
0	R	5	26	10				10			
1		1	2	10				10			
1		2	12	10				10			
1		3	14	10				10			
1		4	24	10				10			
1		5	25	10				10			
10		1	3	10				10			
10		2	8	10				10			
10		3	16	10				10			
10		4	22	10				10			
10		5	30	10				10			
50		1	6	10				10			
50		2	9	10				10			
50		3	17	10				10			
50		4	21	10				10			
50		5	27	10				10			
100		1	5	10				8			
100		2	11	10				9			
100		3	15	10				7			
100		4	20	10				9			
100		5	29	10				9			

CETIS Summary Report

Report Date: 07 Nov-18 14:10 (p 1 of 1)
Test Code: 31248Ab-Comp2 | 02-4816-7480

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5537-8861	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 25 Oct-18 16:45	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 29 Oct-18 16:00	Species: Americamysis bahia	Brine: Not Applicable
Duration: 95h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 01-6129-8063	Code: 31246-103	Client: AECOM
Sample Date: 25 Oct-18 14:05	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 14:05	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
00-7912-3948	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
06-2039-3296	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.840	0.729	0.951	0.700	0.900	0.040	0.089	10.65%	16.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		0.800	0.900	0.700	0.900	0.900

CETIS Analytical Report

Report Date: 07 Nov-18 14:10 (p 1 of 2)
Test Code: 31248Ab-Comp2 | 02-4816-7480

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 00-7912-3948		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:44		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 01-6129-8063		Code: 31246-103			Client: AECOM							
Sample Date: 25 Oct-18 14:05		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 14:05		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1943220	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	3.73	2.82	1.3E-04	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		5	0.840	0.700	0.900	0.089	10.60%	16.0%	42/50	0.84	16.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		0.800	0.900	0.700	0.900	0.900						

CETIS Analytical Report

Report Date: 07 Nov-18 14:10 (p 2 of 2)
Test Code: 31248Ab-Comp2 | 02-4816-7480

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 06-2039-3296		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:44		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 01-6129-8063		Code: 31246-103			Client: AECOM							
Sample Date: 25 Oct-18 14:05		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 14:05		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	751373	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		4	0.875	0.800	0.900	0.050	5.71%	12.5%	35/40	0.875	12.5%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		0.800	0.900	Outlier	0.900	0.900						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:10 (p 1 of 1)
Test Code/ID: 17-5048-7704/31248Ab-Comp3

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	26 Oct-18 18:15	Species:	Americamysis bahia	Sample Code:	31246-105						
End Date:	30 Oct-18 16:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	26 Oct-18 16:15	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				10			
0	LS	2	7	10				10			
0	LS	3	14	10				10			
0	LS	4	22	10				10			
0	LS	5	25	10				10			
0	R	1	4	10				10			
0	R	2	11	10				10			
0	R	3	16	10				10			
0	R	4	21	10				10			
0	R	5	28	10				10			
1		1	6	10				10			
1		2	9	10				10			
1		3	15	10				10			
1		4	23	10				10			
1		5	30	10				9			
10		1	2	10				10			
10		2	8	10				10			
10		3	13	10				10			
10		4	20	10				10			
10		5	27	10				10			
50		1	1	10				10			
50		2	12	10				10			
50		3	18	10				10			
50		4	19	10				10			
50		5	26	10				10			
100		1	5	10				4			
100		2	10	10				1			
100		3	17	10				0			
100		4	24	10				1			
100		5	29	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:11 (p 1 of 1)
Test Code: 31248Ab-Comp3 | 17-5048-7704

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 17-2306-3977	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 18:15	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 16:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 16-4987-4855	Code: 31246-105	Client: AECOM
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018	
Sample Age: 120m	Station: Comp 3 Elutriate (US-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
00-0845-5917	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	71.9	70	74.1	1.391	
13-3464-6310	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	74	69.6	82.9	1.351	
00-6464-8008	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	74	70.9	77.1	1.352	
19-6034-0505	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	71.8	69.9	73.9	1.392	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.120	0.000	0.324	0.000	0.400	0.074	0.164	136.93%	88.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	0.900
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		0.400	0.100	0.000	0.100	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:11 (p 1 of 2)
Test Code: 31248Ab-Comp3 | 17-5048-7704

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 00-6464-8008		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:46		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 16-4987-4855		Code: 31246-105			Client: AECOM						
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018									
Sample Age: 120m		Station: Comp 3 Elutriate (US-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0	12.00%	1.87	0.00911	74	70.9	77.1				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	3.84	2.82	4.0E-05	Outlier Detected						
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
100		5	0.120	0.000	0.400	0.164	137.00%	88.0%	6/50	0.12	88.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	0.900					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		0.400	0.100	0.000	0.100	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:11 (p 2 of 2)
Test Code: 31248Ab-Comp3 | 17-5048-7704

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 19-6034-0505	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:46	Analysis: Trimmed Spearman-Kärber				Official Results: Yes						
Sample ID: 16-4987-4855	Code: 31246-105				Client: AECOM						
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 120m	Station: Comp 3 Elutriate (US-1,-2)										
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0	5.00%	1.86	0.00601	71.8	69.9	73.9				
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
100		4	0.050	0.000	0.100	0.058	115.00%	95.0%	2/40	0.05	95.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	0.900					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		Outlier	0.100	0.000	0.100	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:11 (p 1 of 2)
Test Code: 31248Ab-Comp3 | 17-5048-7704

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Analysis ID: 13-3464-6310	Endpoint: 96h Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 9:46	Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Sample ID: 16-4987-4855	Code: 31246-105	Client: AECOM		Project: Dredged Sediment Evaluation							
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution										
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 120m	Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1177057	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	3.84	2.82	4.0E-05	Outlier Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	74	69.6	82.9	1.351	1.207	1.436					
96h Proportion Survived Summary			Calculated Variate(A/B)					Isotonic Variate			
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%
100		5	0.120	0.000	0.400	0.164	137.00%	88.0%	6/50	0.12	88.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	0.900					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		0.400	0.100	0.000	0.100	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:11 (p 2 of 2)
Test Code: 31248Ab-Comp3 | 17-5048-7704

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.						
Analysis ID: 00-0845-5917		Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:46		Analysis: Linear Interpolation (ICPIN)				Official Results: Yes						
Sample ID: 16-4987-4855		Code: 31246-105				Client: AECOM						
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018										
Sample Age: 120m		Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1635402	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	71.9	70	74.1	1.391	1.349	1.429						
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%	
100		4	0.050	0.000	0.100	0.058	115.00%	95.0%	2/40	0.05	95.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	0.900						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		Outlier	0.100	0.000	0.100	0.000						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:11 (p 1 of 1)
Test Code/ID: 02-4344-2163/31248Ab-Comp4

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	26 Oct-18 18:15	Species:	Americamysis bahia	Sample Code:	31246-107						
End Date:	30 Oct-18 16:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	26 Oct-18 13:10	Material:	Elutriate Solution	Sample Station:	Comp 4 Elutriate (DS-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	4	10				10			
0	LS	2	9	10				10			
0	LS	3	13	10				10			
0	LS	4	23	10				10			
0	LS	5	28	10				10			
0	R	1	1	10				10			
0	R	2	8	10				10			
0	R	3	16	10				10			
0	R	4	19	10				10			
0	R	5	29	10				10			
1		1	6	10				10			
1		2	7	10				10			
1		3	14	10				10			
1		4	20	10				10			
1		5	26	10				10			
10		1	2	10				10			
10		2	11	10				10			
10		3	18	10				10			
10		4	21	10				10			
10		5	27	10				10			
50		1	3	10				10			
50		2	12	10				10			
50		3	15	10				10			
50		4	24	10				10			
50		5	30	10				10			
100		1	5	10				6			
100		2	10	10				7			
100		3	17	10				8			
100		4	22	10				7			
100		5	25	10				5			

CETIS Summary Report

Report Date: 07 Nov-18 14:12 (p 1 of 1)
Test Code: 31248Ab-Comp4 | 02-4344-2163

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 17-2306-3977	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 18:15	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 16:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 04-7608-3506	Code: 31246-107	Client: AECOM
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
07-3362-1766	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
21-2491-4378	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.660	0.518	0.802	0.500	0.800	0.051	0.114	17.28%	34.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		0.600	0.700	0.800	0.700	0.500

CETIS Analytical Report

Report Date: 07 Nov-18 14:12 (p 1 of 2)
Test Code: 31248Ab-Comp4 | 02-4344-2163

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 07-3362-1766		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:47		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7608-3506		Code: 31246-107			Client: AECOM							
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	984719	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	3.36	2.82	0.0025	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		5	0.660	0.500	0.800	0.114	17.30%	34.0%	33/50	0.66	34.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		0.600	0.700	0.800	0.700	0.500						

CETIS Analytical Report

Report Date: 07 Nov-18 14:12 (p 2 of 2)
Test Code: 31248Ab-Comp4 | 02-4344-2163

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 21-2491-4378		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:47		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7608-3506		Code: 31246-107			Client: AECOM							
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	887546	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		4	0.700	0.600	0.800	0.082	11.70%	30.0%	28/40	0.7	30.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		0.600	0.700	0.800	0.700	Outlier						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:12 (p 1 of 1)
Test Code/ID: 12-0424-5958/31248Ab-Comp5

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	26 Oct-18 18:15	Species:	Americamysis bahia	Sample Code:	31246-109						
End Date:	30 Oct-18 16:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	26 Oct-18 15:25	Material:	Elutriate Solution	Sample Station:	Comp 5 Elutriate (TB-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				10			
0	LS	2	10	10				10			
0	LS	3	15	10				10			
0	LS	4	20	10				10			
0	LS	5	29	10				10			
0	R	1	4	10				10			
0	R	2	9	10				10			
0	R	3	13	10				10			
0	R	4	19	10				10			
0	R	5	27	10				10			
1		1	5	10				10			
1		2	7	10				10			
1		3	17	10				10			
1		4	22	10				10			
1		5	30	10				10			
10		1	6	10				10			
10		2	12	10				10			
10		3	14	10				10			
10		4	21	10				10			
10		5	28	10				9			
50		1	3	10				10			
50		2	8	10				10			
50		3	16	10				10			
50		4	23	10				10			
50		5	26	10				10			
100		1	2	10				1			
100		2	11	10				2			
100		3	18	10				0			
100		4	24	10				1			
100		5	25	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:13 (p 1 of 1)
 Test Code: 31248Ab-Comp5 | 12-0424-5958

Americamysis 96-h Acute Survival Test	EnviroSystems, Inc.
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Batch ID: 17-2306-3977	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 18:15	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 16:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 02-4334-9766	Code: 31246-109	Client: AECOM
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
01-2011-4730	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	72.7	69.8	76	1.376	
17-2720-7226	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	71.8	69.9	74	1.392	
02-0213-8458	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	71.8	69.8	73.8	1.394	✓
11-4657-4370	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	72.6	70.3	75.1	1.377	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.080	0.000	0.184	0.000	0.200	0.037	0.084	104.58%	92.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	0.900
50		1.000	1.000	1.000	1.000	1.000
100		0.100	0.200	0.000	0.100	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:12 (p 1 of 1)
Test Code: 31248Ab-Comp5 | 12-0424-5958

Americamysis 96-h Acute Survival Test			EnviroSystems, Inc.		
Analysis ID: 02-0213-8458	Endpoint: 96h Proportion Survived	CETIS Version: CETISv1.9.3			
Analyzed: 07 Nov-18 9:49	Analysis: Trimmed Spearman-Kärber	Official Results: Yes			
Sample ID: 02-4334-9766	Code: 31246-109	Client: AECOM			
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation			
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018				
Sample Age: 3h	Station: Comp 5 Elutriate (TB-1,-2)				

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	5.00%	1.86	0.00614	71.8	69.8	73.8

96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
10		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.99	1.0%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%
100		4	0.050	0.000	0.100	0.058	115.00%	95.0%	2/40	0.05	95.0%

96h Proportion Survived Detail						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	0.900
50		1.000	1.000	1.000	1.000	1.000
100		0.100	Outlier	0.000	0.100	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:12 (p 1 of 2)
Test Code: 31248Ab-Comp5 | 12-0424-5958

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 01-2011-4730	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:49	Analysis: Linear Interpolation (ICPIN)				Official Results: Yes							
Sample ID: 02-4334-9766	Code: 31246-109				Client: AECOM							
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution				Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018											
Sample Age: 3h	Station: Comp 5 Elutriate (TB-1,-2)											
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1089198	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.96	2.82	0.0262	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	72.7	69.8	76	1.376	1.316	1.432						
96h Proportion Survived Summary												
			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.99	1.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
100		5	0.080	0.000	0.200	0.084	105.00%	92.0%	4/50	0.08	92.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	0.900						
50		1.000	1.000	1.000	1.000	1.000						
100		0.100	0.200	0.000	0.100	0.000						

CETIS Analytical Report

Report Date: 07 Nov-18 14:12 (p 2 of 2)
Test Code: 31248Ab-Comp5 | 12-0424-5958

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Analysis ID: 17-2720-7226		Endpoint: 96h Proportion Survived		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:49		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Sample ID: 02-4334-9766		Code: 31246-109		Client: AECOM							
Sample Date: 26 Oct-18 15:25		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 15:25		Source: New Haven Harbor 2018									
Sample Age: 3h		Station: Comp 5 Elutriate (TB-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	578977	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	71.8	69.9	74	1.392	1.351	1.431					
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
10		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.99	1.0%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%
100		4	0.050	0.000	0.100	0.058	115.00%	95.0%	2/40	0.05	95.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	0.900					
50		1.000	1.000	1.000	1.000	1.000					
100		0.100	Outlier	0.000	0.100	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:13 (p 1 of 1)
Test Code/ID: 00-4152-1557/31248Ab-Comp6

Americamysis 96-h Acute Survival Test					EnviroSystems, Inc.						
Start Date:	25 Oct-18 16:45	Species:	Americamysis bahia		Sample Code:	31246-111					
End Date:	29 Oct-18 16:00	Protocol:	EPA/821/R-02-012 (2002)		Sample Source:	New Haven Harbor 2018					
Sample Date:	25 Oct-18 15:20	Material:	Elutriate Solution		Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)					

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	6	10				10			
0	LS	2	11	10				10			
0	LS	3	18	10				10			
0	LS	4	21	10				10			
0	LS	5	28	10				10			
0	R	1	2	10				10			
0	R	2	12	10				10			
0	R	3	16	10				10			
0	R	4	23	10				10			
0	R	5	30	10				10			
1		1	5	10				10			
1		2	10	10				10			
1		3	17	10				10			
1		4	20	10				10			
1		5	27	10				10			
10		1	3	10				9			
10		2	8	10				10			
10		3	13	10				10			
10		4	19	10				10			
10		5	29	10				10			
50		1	4	11				11			
50		2	7	10				10			
50		3	15	10				10			
50		4	22	10				10			
50		5	25	10				10			
100		1	1	10				10			
100		2	9	10				10			
100		3	14	10				10			
100		4	24	10				10			
100		5	26	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 14:13 (p 1 of 1)
Test Code: 31248Ab-Comp6 | 00-4152-1557

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5537-8861	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 25 Oct-18 16:45	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 29 Oct-18 16:00	Species: Americamysis bahia	Brine: Not Applicable
Duration: 95h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 08-5165-6327	Code: 31246-111	Client: AECOM
Sample Date: 25 Oct-18 15:20	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 15:20	Source: New Haven Harbor 2018	
Sample Age: 85m	Station: Comp 6 Elutriate (CAD-1,-2,-3)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
02-5492-5632	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
04-7969-6571	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		0.900	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:13 (p 1 of 2)
Test Code: 31248Ab-Comp6 | 00-4152-1557

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 02-5492-5632		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:51		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 08-5165-6327		Code: 31246-111			Client: AECOM							
Sample Date: 25 Oct-18 15:20		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 15:20		Source: New Haven Harbor 2018										
Sample Age: 85m		Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1807598	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	4.38	2.82	1.8E-07	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	0.980	0.900	1.000	0.045	4.56%	2.0%	49/50	0.993	0.67%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	51/51	0.993	0.67%	
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.993	0.67%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		0.900	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	1.000	1.000	1.000						

CETIS Analytical Report

Report Date: 07 Nov-18 14:13 (p 2 of 2)
Test Code: 31248Ab-Comp6 | 00-4152-1557

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Analysis ID: 04-7969-6571	Endpoint: 96h Proportion Survived					CETIS Version: CETISv1.9.3					
Analyzed: 07 Nov-18 9:51	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes					
Sample ID: 08-5165-6327	Code: 31246-111					Client: AECOM					
Sample Date: 25 Oct-18 15:20	Material: Elutriate Solution					Project: Dredged Sediment Evaluation					
Receipt Date: 25 Oct-18 15:20	Source: New Haven Harbor 2018										
Sample Age: 85m	Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1527669	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
10		4	1.000	1.000	1.000	0.000	0.00%	0.0%	40/40	1	0.0%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	51/51	1	0.0%
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		Outlier	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		1.000	1.000	1.000	1.000	1.000					

Americamysis bahia
Suspended Particulate Phase

Bench Sheets

Mitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31291	Incubator ID:	20
Project:	New Haven	Client:	AECOM

Composites 1, 2, 3, 4, 5 & 6

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input checked="" type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 1 ppt 2 (E3) JTP 12/07/18 pH: 7.8 ± 0.5	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C (E3) JTP 12/07/18 Photoperiod: 16 hour light, 8 hour dark
--	---

Test Chamber	Solution Volume
(Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL Tumbler	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____

Replicate Information

<i>A. bahia</i> and <i>M. beryllina</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 10 organisms per chamber 	<i>Arbacia</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 20-30 embryos/mL
--	---

Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)

Feeding

<i>A. bahia</i>: Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i>: Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i>: NONE	

Date: 10/31/18

Initial BG



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species AMERICANYSIS bahia

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10-27-18 Receipt date _____

Lot number 102718MS Strain _____

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. _____ ppm

pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers _____ YCT _____ Other ENCAP. SHRIMP DIET

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: EST # of Organisms 2800+

Carrier: _____ Date shipped 10-29-18

Biologist: Mark Desjardis

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31291 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: ^{Red} water		Composite #: 5	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	2000	0	2,000			0	2,000
(RW)	0	↓	0	↓			0	↓
1 %	20	↓	20	↓			20	↓
10 %	200	↓	200	↓			200	↓
50 %	1000	↓	1,000	↓			1,000	↓
100 %	2000	↓	2,000	↓			2,000	↓
Initial	MW		MW				MW	
Date	10/31/18		10/31/18				10/31/18	
Time	1250		1258				1415	
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.5		25.1		27.4		25.1	
Vol of Elutriate (mL)	5,000		5,000		75,000		5,000 mL	
Grams of Salt (g)	31.7g		28.2		224.6g		28.2g	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	28.0		28.2		28.4		28.4	
Date & Initial	10/31/18 MW		10/31/18 MW		10/31/18 LA9		10/31/18	

PREPARATION of DILUTIONS

STUDY: 31291 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 4		Composite #: 4		Composite #: 3		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	2,000	0	2000	0	2,000		
(RW)	0	↓	0	↓	0	↓		
1 %	20	↓	20	↓	20	↓		
10 %	200	↓	200	↓	200	↓		
50 %	1,000	↓	1,000	↓	1,000	↓		
100 %	2,000	↓	2,000	↓	2,000	↓		
Initial	MW		MW		MW			
Date	10/31/18		10/31/18		10/31/18			
Time	1505		1450		1530			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	25.4		25.1		25.7		25.7 A 10/31	
Vol of Elutriate (mL)	5,000		5,000		5,000			
Grams of Salt (g)	10.3g		28.2g		24.8g			
Lot number of Salt	A- 5117		A- 5117		A- 5117		A	
Final Salinity	28.1		28.3		28.1			
Date & Initial	10/31/18 MW		10/31/18 MW		10/31/18 MW			

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:** I
Test Species: *Americamysis bahia* **Lot ID:** 02ABAR0102918 **Sample:** Controls **Diluent:** CLDS

SURVIVAL - Controls															
Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB (control water)	A	10	10	10	10	10	10	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	10		B	10	10	10	10	10	10
	C	10	10	10	10	10	10		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	10
	E	10	10	10	10	10	10		E	10	10	10	10	10	10
Initials		MS	MW	MW	MW	CFS	MT	Comments: 10/31/18 11/04 Daylight savings (E10)							
Date		10/31/18	10/31/18	11/01/18	11/21/18	11/03	11/04								
Time		1510	1630	1310	1430	1350	1250								

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
345-346	397-398
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
LAB	A	7.3	7.0	6.5	6.2	6.9	8.0	7.93	7.85	7.70	7.84	19	20	20	20	26	31	33	32	34	34	/	/	/	/	32
(RW)	A	8.7	6.8	6.1	5.8	6.2	7.97	7.88	7.79	7.71	7.73	19	20	20	20	20	29	30	30	31	33	/	/	/	/	/
Initials		MT	MT	CFS	MW	LAG	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #		MLO2			DO Meter #		MLO1		
Time		1330	0900	1045	1100	0935						0	24	48	72	96	DO Probe #		160			DO Probe #		96		
Incub. Temp		21	20	20	20	21	Water Quality Station #					2	1	2	1	1	pH Meter #		MLO2			pH Meter #		MLO1		
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #					MLO1	MLO2	MLO1	MLO2	MLO2	pH Probe #		163			pH Probe #		158		
Fed By:		MW	MW	MW	CFS	/	Initial					MT	MT	CFS	MW	LAG	Salinity Meter #		MLO2			Salinity Meter #		MLO1		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Amencamysis habia* **Lot ID:** 02AbAR0102918 **Sample:** Composite #1 **Diluent:** CLDS

SURVIVAL - Composite #6 | 10/31

Conc	Rep	HOURS						Conc	Rep	HOURS															
		0	1	24	48	72	96			0	1	24	42	72	96										
1 %	A	10	10	10	10	10	10	50 %	A	10	10	10	10	10	10										
	B	10	10	10	10	10	10		B	10	10	10	10	10	10										
	C	10	10	10	10	10	10		C	10	10	10	10	10	10										
	D	10	10	10	10	10	10		D	10	10	10	10	10	10										
	E	10	10	10	10	9	9		E	10	10	10	10	10	10										
10 %	A	10	10	10	10	10	10	100 %	A	10	10	10	10	10	10										
	B	10	10	10	10	10	10		B	10	10	10	10	10	10										
	C	10	10	10	10	10	10		C	10	10	10	10	10	10										
	D	10	10	10	10	10	10		D	10	10	10	10	10	10										
	E	10	10	10	10	10	10		E	10	10	10	10	10	10										
Initials		MS	MW	MW	MW	CFS	MT																		
Date		10/31/18	10/31/18	11/01/18	11/02/18	11/03	11/04																		
Time		1540	1635	1325	1435	1355	1300																		

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
347-350	399-402
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments: (E10)
~~MT~~ 11/04 Daylight Savings
 MT 11/04

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.4	7.2	6.6	6.2	6.5	7.92	7.94	7.90	7.82	7.76	20	20	20	20	20	29	30	30	31	32						
10 %	A	8.2	7.1	6.7	6.3	6.7	7.96	7.94	7.88	7.80	7.82	20	20	20	20	20	29	30	30	31	32						
50 %	A	7.7	7.1	6.2	6.3	6.6	7.91	7.92	7.85	7.76	7.80	20	20	20	20	20	28	29	29	30	31						
100 %	A	6.6	6.8	6.2	5.9	6.4	7.85	7.87	7.82	7.80	7.82	21	20	20	20	20	28	29	28	29	30						
Initials		MT	MT	CFS	MW	LE	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2					
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #					DO Meter #					
Time		1350	0910	1050	1105	0940	0 24 48 72 96										DO Probe #					DO Probe #					
Incub. Temp		21	20	20	20	21	Water Quality Station #										pH Meter #					pH Meter #					
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #										pH Probe #					pH Probe #					
Fed By:		MW	MW	MW	CFS		Initial										Salinity Meter #					Salinity Meter #					

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis bahia* **Lot ID:** 02ABARD102918 **Sample:** Composite #2 **Diluent:** CLDS

SURVIVAL - Composite #52 (F2) D6 10/31

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	9	9	9	9
	E	10	10	10	9	9	9
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
351-354	403-406
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Initials	MS	MW	MW	MW	CFS	MT
Date	10/31/18	10/31/18	11/01	11/02	11/03	11/04
Time	1530	1640	1345	1445	1410	1315

Comments:
 @ 11/04 Daylight Savings
 (E10)

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	6.8	6.2	6.2	6.0	7.96	7.85	7.74	7.70	7.64	19	20	20	20	20	29	30	29	31	31					
10 %	A	8.2	7.0	6.2	6.1	6.4	7.97	7.90	7.79	7.74	7.79	19	20	20	20	20	29	30	29	31	31					
50 %	A	7.4	6.9	6.0	6.1	6.2	7.91	7.91	7.79	7.72	7.77	19	20	20	20	20	28	29	29	30	31					
100 %	A5	8.3	6.8	5.9	5.8	6.1	7.85	7.90	7.76	7.73	7.80	19	20	20	20	20	28	29	28	30	30					

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED					Water Quality Station #1		Water Quality Station #2		
				Exposure (Hours)					DO Meter #	pH Meter #	DO Meter #	pH Meter #	
MT	10/31	1340	21	0	24	48	72	96	MLO2	MLO2	MLO1	MLO1	
MT	11/01	0915	20	0	24	48	72	96	160	MLO2	96	MLO1	
CFS	11/02	1105	20	0	24	48	72	96	160	MLO2	158	MLO1	
MW	11/03	1115	20	0	24	48	72	96	163	MLO2	158	MLO1	
LAG	11/04	1410	22	0	24	48	72	96	163	MLO2	158	MLO1	
FEEDING: <i>Artemia nauplii</i> (A-5179)				Water Quality Station #		Thermometer or Probe #		Initial		Salinity Meter #		Salinity Meter #	
Fed By:				2		MLO1		MT		MLO2		MLO1	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis bahia* **Lot ID:** 02ABAR0102918 **Sample:** Composite #3 **Diluent:** CLDS

SURVIVAL - Composite #63 ^{26 10/31}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	9	9	9
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	9	9	9
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		MS	MW	MW	MW	CFS	MT
Date		10/31/18	10/31/18	11/1/18	11/2/18	11/03	11/04
Time		1545	1445	1425	1450	1420	1310

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
355 - 358	407 - 410
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:
 SET 11/04
 MT 11/04 Daylight Savings
 (EIO)

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	7.3	6.3	5.8	6.3	7.98	7.75	7.80	7.71	7.69	20	20	20	20	20	29	30	30	31	31					
10 %	A	8.3	7.3	6.3	5.8	6.7	7.97	7.96	7.83	7.73	7.79	20	20	20	20	20	29	30	30	31	31					
50 %	A	7.6	7.0	6.1	5.7	6.5	7.90	7.91	7.80	7.74	7.79	20	20	20	20	20	29	29	29	30	31					
100 %	A	5.6	6.8	6.2	5.7	6.4	7.79	7.89	7.85	7.79	7.83	21	20	20	20	20	28	29	28	29	30					

Initials		RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2				
Date		Exposure (Hours)					DO Meter #					DO Meter #				
Time							DO Probe #					DO Probe #				
Incub. Temp		Water Quality Station #					pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)		Thermometer or Probe #					pH Probe #					pH Probe #				
Fed By:		Initial					Salinity Meter #					Salinity Meter #				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis bahia* **Lot ID:** 02ABARO102918 **Sample:** Composite #4 **Diluent:** CLDS

SURVIVAL - Composite # 84 ^{10/21}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		M5	MW	MW	MW	CFS	MT
Date		10/31/18	10/31/18	11/01/18	11/2	11/03	11/04
Time		1600	1700	1435	1505	1430	1350

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10

Comments:
 (2) MT 11/04 Daylight Savings
 (10)

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
359-362	411-414
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.2	7.0	6.4	6.2	7.2	7.95	7.88	7.81	7.76	7.86	20	20	20	20	30	30	30	30	31							
10 %	A	8.3	6.4	5.7	5.8	6.5	7.97	7.82	7.73	7.68	7.78	20	20	20	20	29	30	30	30	31							
50 %	A	7.6	6.5	6.1	6.0	6.5	7.97	7.88	7.83	7.80	7.82	19	20	20	20	29	29	29	30	30							
100 %	A	5.7	6.4	6.2	6.0	6.7	7.95	7.88	7.82	7.84	7.89	19	20	20	20	28	29	28	29	30							

RECORD OF METERS USED		Exposure (Hours)					Water Quality Station #1		Water Quality Station #2	
		0	24	48	72	96	DO Meter #	MLO2	DO Meter #	MLO1
Water Quality Station #		1	1	2	1	1	DO Probe #	160	DO Probe #	96
Thermometer or Probe #		M02	M02	M02	M02	M02	pH Meter #	M02	pH Meter #	MLO1
Initial		LAG	MT	CFS	MW	LAG	pH Probe #	163	pH Probe #	158
							Salinity Meter #	MLO2	Salinity Meter #	MLO1

FEEDING: <i>Artemia nauplii</i> (A-5179)				
Fed By:	MW	MW	MW	CFS

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:** #1
Test Species: *Americamysis bahia* **Lot ID:** 02ABARO102918 **Sample:** Composite #5 **Diluent:** CLDS

SURVIVAL - Composite #85 ^{10/21}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		MW	MW	MW	MW	CFS	MT
Date		10/31/18	11/1/18	11/11/18	11/12	11/03	11/04
Time		1615	1715	1445	1515	1445	1340

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	9	9	9

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
363-366	415-418
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:
 (210) MT 11/04 Daylight Savings
 (210)

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.2	7.1	6.9	6.2	7.0	7.97	7.91	7.94	7.83	7.79	20	20	20	20	19	30	30	30	31	31	/	/	/	/	/
10 %	A	8.2	7.1	6.7	5.8	6.6	7.96	7.95	7.91	7.74	7.82	19	19	20	20	20	29	30	30	31	31	/	/	/	/	/
50 %	A	7.5	7.0	6.7	5.7	6.7	7.92	7.93	7.92	7.84	7.88	19	19	20	20	20	29	30	29	30	31	/	/	/	/	/
100 %	A	6.0	7.0	6.7	5.7	6.7	7.80	7.94	7.96	7.87	7.91	19	20	20	20	20	28	29	28	30	30	/	/	/	/	/
Initials		LAG	MT	CFS	MW	LAG	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04											Exposure (Hours)									
Time		1510	0935	1125	1150	1020	0 24 48 72 96																			
Incub. Temp		21	20	20	20	21											Water Quality Station #					1	1	2	1	1
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #					MLO2	MLO2	MLO1	MLO2	MLO2	pH Probe #		163	pH Probe #		158				
Fed By:		MW	MW	MW	CFS	/	Initial					LAG	MT	CFS	MW	LAG	Salinity Meter #		MLO2	Salinity Meter #		MLO1				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Americamysis* **Lot ID:** 02AbARO102918 **Sample:** Composite #6 **Diluent:** CLDS
habia

SURVIVAL - Composite # 6

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
50 %	A	10	10	9	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	11	11
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10

Initials	MW	MW	MW	MW	CFS	MT
Date	10/31/18	10/31/18	11/1/18	11/2/18	11/02	11/04
Time	1635	1720	1522	1525	1455	1330

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
367-370	419-422
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:
 (E) 11/6/18 (NR) 11 brgs used from start in stats
 (E) 11/10/18 Daylight Savings
 (E) 11/6/18 (NR) 11 brgs used from start in stats

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	7.0	5.9	5.7	6.7	7.94	7.90	7.73	7.68	7.76	20	20	20	20	20	29	30	29	30	30					
10 %	A	8.3	7.0	5.8	6.0	6.6	7.97	7.92	7.73	7.75	7.80	20	20	20	20	20	29	30	29	31	30					
50 %	A	7.6	6.6	6.0	5.9	6.6	7.97	7.89	7.80	7.77	7.82	21	20	20	20	20	29	29	29	30	30					
100 %	A	5.8	6.6	6.3	5.7	6.5	7.97	7.93	7.88	7.80	7.86	22	20	20	20	20	28	29	28	30	30					

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED					Water Quality Station #1		Water Quality Station #2	
				Exposure (Hours)					DO Meter #	DO Probe #	DO Meter #	DO Probe #
LAG	11/01	1135	21	0	24	48	72	96	M102	160	M101	96
MT	11/01	0930	20	1	1	2	1	2	M107	M107	M101	M101
CFS	11/02	1158	20	M102	M102	M101	M102	M101	163	163	158	158
MW	11/03	1025	21	Initial	LAG	MT	CFS	MW	LAG	M102	M102	M101

FEEDING: <i>Artemia nauplii</i> (A-5179)
Fed By: MW MW MW CFS

Assay Review Checklist

DATE IN: 10/31/18 STUDY#: 31291
 DATE DUE: _____ CLIENT: AECOM
 PROJECT: NHH-2018
 ASSAY: A196SPP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/31/18	MW	
Day 1	11/01/18	MW	
Day 2	11/02/18	MW	
Day 3	11/03	CFS	
Day 4	11/04	MT	
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/6/18	MR	
Statistical Analysis Reviewed	11/7/18	LF	
Data Acceptability Review	11/7/18	MR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

Americamysis bahia
Suspended Particulate Phase
Statistical Analysis Reports
Survival
Mitigated Assays

CETIS Test Data Worksheet

Report Date: 06 Nov-18 15:58 (p 1 of 1)
Test Code/ID: 20-8258-0644/31291Ab-Comp1

Americamysis 96-h Acute Survival Test					EnviroSystems, Inc.						
Start Date:	31 Oct-18 15:30	Species:	Americamysis bahia			Sample Code:	31246-112				
End Date:	04 Nov-18 13:15	Protocol:	EPA/821/R-02-012 (2002)			Sample Source:	New Haven Harbor 2018				
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution			Sample Station:	Comp 1 Elutriate (V',W')				

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				10			
0	LS	2	10	10				10			
0	LS	3	13	10				10			
0	LS	4	23	10				10			
0	LS	5	30	10				10			
0	R	1	4	10				10			
0	R	2	7	10				10			
0	R	3	17	10				10			
0	R	4	21	10				10			
0	R	5	28	10				10			
1		1	5	10				10			
1		2	8	10				10			
1		3	16	10				10			
1		4	22	10				10			
1		5	29	10				9			
10		1	6	10				10			
10		2	9	10				10			
10		3	15	10				10			
10		4	24	10				10			
10		5	26	10				10			
50		1	1	10				10			
50		2	12	10				10			
50		3	14	10				10			
50		4	20	10				10			
50		5	25	10				10			
100		1	2	10				10			
100		2	11	10				10			
100		3	18	10				10			
100		4	19	10				10			
100		5	27	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:15 (p 1 of 1)
Test Code: 31291Ab-Comp1 | 20-8258-0644

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 12-3991-1381	Code: 31246-112	Client: AECOM
Sample Date: 31 Oct-18 10:40	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 10:40	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 1 Elutriate (V,W')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
09-7930-0591	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
20-0808-6694	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	0.900
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:15 (p 1 of 1)
Test Code: 31291Ab-Comp1 | 20-8258-0644

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 09-7930-0591		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:15		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 12-3991-1381		Code: 31246-112			Client: AECOM						
Sample Date: 31 Oct-18 10:40		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 31 Oct-18 10:40		Source: New Haven Harbor 2018									
Sample Age: 5h		Station: Comp 1 Elutriate (V,W')									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	221686	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		4	1.000	1.000	1.000	0.000	0.00%	0.0%	40/40	1	0.0%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	Outlier					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	1.000	1.000	1.000	1.000					
100		1.000	1.000	1.000	1.000	1.000					

CETIS Test Data Worksheet

Report Date: 06 Nov-18 15:59 (p 1 of 1)
Test Code/ID: 16-1316-1315/31291Ab-Comp2

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 15:30	Species:	Americamysis bahia	Sample Code:	31246-113						
End Date:	04 Nov-18 13:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	5	10				10			
0	LS	2	8	10				10			
0	LS	3	18	10				10			
0	LS	4	24	10				10			
0	LS	5	26	10				10			
0	R	1	6	10				10			
0	R	2	9	10				10			
0	R	3	16	10				10			
0	R	4	20	10				10			
0	R	5	27	10				10			
1		1	3	10				10			
1		2	10	10				10			
1		3	15	10				10			
1		4	21	10				9			
1		5	30	10				9			
10		1	1	10				10			
10		2	11	10				10			
10		3	17	10				10			
10		4	22	10				10			
10		5	28	10				10			
50		1	4	10				10			
50		2	12	10				10			
50		3	13	10				10			
50		4	23	10				10			
50		5	29	10				10			
100		1	2	10				10			
100		2	7	10				10			
100		3	14	10				10			
100		4	19	10				10			
100		5	25	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:16 (p 1 of 1)
Test Code: 31291Ab-Comp2 | 16-1316-1315

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 21-3473-6624	Code: 31246-113	Client: AECOM
Sample Date: 31 Oct-18 10:40	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 10:40	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
00-5076-6875	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	4.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	0.900	0.900
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:16 (p 1 of 1)
Test Code: 31291Ab-Comp2 | 16-1316-1315

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 00-5076-6875		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:15		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 21-3473-6624		Code: 31246-113			Client: AECOM							
Sample Date: 31 Oct-18 10:40		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 10:40		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	125693	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.68	2.82	0.0918	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	0.960	0.900	1.000	0.055	5.71%	4.0%	48/50	0.99	1.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	0.900	0.900						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	1.000	1.000	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:00 (p 1 of 1)
Test Code/ID: 02-7220-5392/31291Ab-Comp3

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 15:30	Species:	Americamysis bahia	Sample Code:	31246-114						
End Date:	04 Nov-18 13:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 12:50	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				10			
0	LS	2	9	10				10			
0	LS	3	14	10				10			
0	LS	4	23	10				10			
0	LS	5	27	10				10			
0	R	1	2	10				10			
0	R	2	11	10				10			
0	R	3	18	10				10			
0	R	4	24	10				10			
0	R	5	29	10				10			
1		1	3	10				10			
1		2	12	10				9			
1		3	13	10				10			
1		4	22	10				10			
1		5	26	10				9			
10		1	6	10				10			
10		2	8	10				10			
10		3	16	10				10			
10		4	20	10				10			
10		5	25	10				10			
50		1	4	10				10			
50		2	10	10				10			
50		3	17	10				10			
50		4	19	10				10			
50		5	30	10				10			
100		1	5	10				10			
100		2	7	10				10			
100		3	15	10				10			
100		4	21	10				10			
100		5	28	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:17 (p 1 of 1)
Test Code: 31291Ab-Comp3 | 02-7220-5392

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 08-9579-5849	Code: 31246-114	Client: AECOM
Sample Date: 31 Oct-18 12:50	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 12:50	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 3 Elutriate (US-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
01-9084-4740	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	4.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	0.900	1.000	1.000	0.900
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:17 (p 1 of 1)
Test Code: 31291Ab-Comp3 | 02-7220-5392

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 01-9084-4740		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:16		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 08-9579-5849		Code: 31246-114			Client: AECOM							
Sample Date: 31 Oct-18 12:50		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 12:50		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1725243	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.68	2.82	0.0918	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	0.960	0.900	1.000	0.055	5.71%	4.0%	48/50	0.99	1.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	0.99	1.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	0.900	1.000	1.000	0.900						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	1.000	1.000	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:01 (p 1 of 1)
Test Code/ID: 13-3161-0080/31291Ab-Comp4

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 15:30	Species:	Americamysis bahia	Sample Code:	31246-115						
End Date:	04 Nov-18 13:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 12:50	Material:	Elutriate Solution	Sample Station:	Comp 4 Elutriate (DS-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	6	10				10			
0	LS	2	12	10				10			
0	LS	3	16	10				10			
0	LS	4	21	10				10			
0	LS	5	28	10				10			
0	R	1	5	10				10			
0	R	2	9	10				10			
0	R	3	15	10				10			
0	R	4	19	10				10			
0	R	5	30	10				10			
1		1	3	10				10			
1		2	11	10				10			
1		3	18	10				10			
1		4	22	10				10			
1		5	25	10				10			
10		1	4	10				10			
10		2	7	10				10			
10		3	14	10				10			
10		4	23	10				10			
10		5	27	10				10			
50		1	1	10				10			
50		2	8	10				10			
50		3	13	10				10			
50		4	20	10				10			
50		5	29	10				10			
100		1	2	10				10			
100		2	10	10				10			
100		3	17	10				10			
100		4	24	10				10			
100		5	26	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:18 (p 1 of 1)
Test Code: 31291Ab-Comp4 | 13-3161-0080

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 13-1258-1800	Code: 31246-115	Client: AECOM
Sample Date: 31 Oct-18 12:50	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 12:50	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
09-4809-5839	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:18 (p 1 of 1)
Test Code: 31291Ab-Comp4 | 13-3161-0080

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 09-4809-5839		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:17		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 13-1258-1800		Code: 31246-115			Client: AECOM							
Sample Date: 31 Oct-18 12:50		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 12:50		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	152548	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	1.000	1.000	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:02 (p 1 of 1)
Test Code/ID: 09-2457-9639/31291Ab-Comp5

Americamysis 96-h Acute Survival Test				EnviroSystems, Inc.			
Start Date: 31 Oct-18 15:30	Species: Americamysis bahia	Sample Code: 31246-116					
End Date: 04 Nov-18 13:15	Protocol: EPA/821/R-02-012 (2002)	Sample Source: New Haven Harbor 2018					
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution	Sample Station: Comp 5 Elutriate (TB-1,-2)					

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				10			
0	LS	2	12	10				10			
0	LS	3	16	10				10			
0	LS	4	19	10				10			
0	LS	5	26	10				10			
0	R	1	3	10				10			
0	R	2	7	10				10			
0	R	3	13	10				10			
0	R	4	22	10				10			
0	R	5	28	10				10			
1		1	6	10				10			
1		2	10	10				10			
1		3	14	10				10			
1		4	21	10				10			
1		5	25	10				10			
10		1	2	10				10			
10		2	8	10				10			
10		3	18	10				10			
10		4	24	10				10			
10		5	27	10				10			
50		1	4	10				10			
50		2	11	10				10			
50		3	15	10				10			
50		4	20	10				10			
50		5	29	10				10			
100		1	5	10				10			
100		2	9	10				10			
100		3	17	10				10			
100		4	23	10				10			
100		5	30	10				9			

CETIS Summary Report

Report Date: 07 Nov-18 10:19 (p 1 of 1)
Test Code: 31291Ab-Comp5 | 09-2457-9639

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 09-1743-2857	Code: 31246-116	Client: AECOM
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 11:25	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
01-0024-9460	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
15-8346-2971	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	0.900

CETIS Analytical Report

Report Date: 07 Nov-18 10:19 (p 1 of 1)
Test Code: 31291Ab-Comp5 | 09-2457-9639

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 15-8346-2971		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:19		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 09-1743-2857		Code: 31246-116			Client: AECOM							
Sample Date: 31 Oct-18 11:25		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 11:25		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 5 Elutriate (TB-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	82587	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%	
100		4	1.000	1.000	1.000	0.000	0.00%	0.0%	40/40	1	0.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	1.000	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	1.000	1.000	Outlier						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:04 (p 1 of 1)
Test Code/ID: 16-7832-8989/31291Ab-Comp6

Americamysis 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 15:30	Species:	Americamysis bahia	Sample Code:	31246-117						
End Date:	04 Nov-18 13:15	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 11:25	Material:	Elutriate Solution	Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	6	10				10			
0	LS	2	10	10				10			
0	LS	3	14	10				10			
0	LS	4	23	10				10			
0	LS	5	27	10				10			
0	R	1	5	10				10			
0	R	2	8	10				10			
0	R	3	17	10				10			
0	R	4	22	10				10			
0	R	5	26	10				10			
1		1	3	10				10			
1		2	11	10				10			
1		3	18	10				10			
1		4	21	10				10			
1		5	25	10				10			
10		1	2	10				10			
10		2	12	10				10			
10		3	15	10				10			
10		4	19	10				10			
10		5	29	10				10			
50		1	4	10				9			
50		2	9	10				10			
50		3	13	10				10			
50		4	20	10				10			
50		5	30	10				10			
100		1	1	10				10			
100		2	7	11				11			
100		3	16	10				10			
100		4	24	10				10			
100		5	28	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:20 (p 1 of 1)
Test Code: 31291Ab-Comp6 | 16-7832-8989

Americamysis 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 15-2590-5812	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 15:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:15	Species: Americamysis bahia	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age: 4 d

Sample ID: 07-9158-2244	Code: 31246-117	Client: AECOM
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 11:25	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 6 Elutriate (CAD-1,-2,-3)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
10-5547-9027	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
13-2967-6639	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	R	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	2.00%
100		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	1.000	1.000	1.000
0	R	1.000	1.000	1.000	1.000	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		0.900	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:20 (p 1 of 1)
Test Code: 31291Ab-Comp6 | 16-7832-8989

Americamysis 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 10-5547-9027	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3				Official Results: Yes		
Analyzed: 07 Nov-18 10:20	Analysis: Linear Interpolation (ICPIN)										
Sample ID: 07-9158-2244	Code: 31246-117				Client: AECOM						
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 31 Oct-18 11:25	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	679504	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
96h Proportion Survived Summary											
			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
10		5	1.000	1.000	1.000	0.000	0.00%	0.0%	50/50	1	0.0%
50		4	1.000	1.000	1.000	0.000	0.00%	0.0%	40/40	1	0.0%
100		5	1.000	1.000	1.000	0.000	0.00%	0.0%	51/51	1	0.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	1.000	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	1.000					
50		Outlier	1.000	1.000	1.000	1.000					
100		1.000	1.000	1.000	1.000	1.000					

Menidia beryllina
Suspended Particulate Phase

Bench Sheets

Unmitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY			
Study #:	31248	Incubator ID:	2
Project:	New Haven	Client:	AECOM
Composites 1, 2 & 6			
Summary of Test Conditions			
Exposure		Species Used	
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours		(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input checked="" type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)	
Water Quality Parameters			
Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 3 ppt 2 (3) NR 11/2/18		Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C (3) NR 11/2/18	
pH: 7.8 ± 0.5		Photoperiod: 16 hour light, 8 hour dark	
Test Chamber		Solution Volume	
(Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL tumbler		(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____	
Replicate Information			
<i>A. bahia</i> and <i>M. beryllina</i> : • 5 Reps per treatment • 10 organisms per chamber		<i>Arbacia</i> : • 5 Reps per treatment • 20-30 embryos/mL	
Cleaning		Treatments	
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).		Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)	
Feeding			
<i>A. bahia</i> : Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day		<i>M. beryllina</i> : Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day	
<i>Arbacia</i> : NONE			
Date: 10/26/18		Initial: BS	



ES 16124
CSARO-MBARO102418

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species MENIDIA BERYLLINA

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10-16-18 Receipt date _____

Lot number 101318 MB Strain _____

Brood origination CAPE COD MA

II. Water Quality

Temperature 25 °C Salinity ~28 ppt D.O. _____ ppm

pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers YCT _____ Other ENCY. SHRIMP DIET

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: EST/ENTHALPY # of Organisms 2800+

Carrier: _____ Date shipped 10-24-18

Biologist: Mark Donaghy

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven
ASSAY: MB96SPP
SPECIES: *M. beryllina*

BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 1124024313

Date / Initials: 10/26/18 LCI *RCI*

Rep	
1	0.00422
2	0.00292
3	0.00228
4	0.0039
5	0.00217
6	0.00324
7	0.00403
8	0.00217
9	0.00209
10	0.00211
11	0.00191
12	0.00235
13	0.00178
14	0.00196
15	0.00087
16	0.00128
17	0.001
18	0.00205
19	0.00151
20	0.00096
Mean Weight (g):	0.00224
Test Volume (L):	0.2
Loading Rate(g/L):	0.11200

PREPARATION of DILUTIONS

STUDY: 31248 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: 6		Composite #: CLDS	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1,000	0	1,000	0	1,000	0	1000
(RW)	0	↓	0	↓	0	↓	0 excess 101g +60	↓
1 %	10	↓	10	↓	10	↓	/	
10 %	100	↓	100	↓	100	↓		
50 %	500	↓	500	↓	500	↓		
100 %	1000	↓	1,000	↓	1,000	↓		
Initial	MW		CFS		CFS		CFS	
Date	10/26/18		10/26		10/26		10/26	
Time	1255		1325		1350		1300	
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.7		24.6		24.2		27.4	
Vol of Elutriate (mL)	4,000		4,000		4,000		4,000	
Grams of Salt (g)	24.4g		24.9g		26.7		11.9g	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	28.3		28.2		28.1		27.9	
Date & Initial	10/26/18	MW	10/26/18	MW	10/26/18	MW	10/26/18	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08M6ARO102418 **Sample:** Controls **Diluent:** CLDS

SURVIVAL - Controls - Beakers

Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB control water)	A	10	10	10	10	10	10	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	10		B	10	10	10	10	10	10
	C	10	10	10	10	10	9		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	9
	E	10	10	10	10	9	9		E	10	10	10	10	10	10
Initials		MW	GRS	MW	LAG	MT	MW	Comments:							
Date		10/26/18	10/26/18	10/27/18	10/28	10/29	10/30								
Time		1430	1520	1310	1445	1640	1253								

EIG LAG 10/27
Beaker tipped
over, lost
~100µL

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
226-227	298-300 299 280-281

NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)						
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96		
LAB	A	6.5	6.9	6.8	6.7	7.92	7.83	7.87	7.80	7.75	23	20	19	19	19	30	32	33	29	30								
(RW)	A	8.3	7.0	6.8	6.8	7.89	7.89	7.89	7.81	7.80	19	20	19	19	19	28	30	30	30	31								
Initials		MT	LCI	CFS	LAG	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2						
Date		10/26	10/27	10/28	10/29	10/30	Exposure (Hours)										DO Meter #		MLO1			DO Meter #		MLO2				
Time		1330	1144	1310	1520	1015						0	24	48	72	96	DO Probe #		96			DO Probe #		160				
Incub. Temp		21	21	21	21	21	Water Quality Station #					2	1	1	2	1	pH Meter #		MLO1			pH Meter #		MLO2				
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #					MLO1	MLO2	MLO2	MLO1	MLO2	pH Probe #		158			pH Probe #		163				
Fed By:		MW	MW	GRS	MS		Initial					MT	LCI	CFS	LAG	MT	Salinity Meter #		MLO1			Salinity Meter #		MLO2				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248	Project: New Haven	Client: AECOM	Incubator ID:
Test Species: <i>Menidia beryllina</i>	Lot ID: 08MBARO 102418	Sample: Composite #1	Diluent: CLDS

SURVIVAL - Composite # 1

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		GKS	CFS	MW	LAI	MT	MW
Date		10/24/18	10/26	10/27	10/28	10/29	10/30
Time		1310	1520	1234	1450	1640	1255

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	8	8
	D	10	10	10	10	10	10
	E	10	10	10	10	10	9
100 %	A	10	10	10	0	0	0
	B	10	10	10	1	0	0
	C	10	10	10	3	0	0
	D	10	10	10	4	0	0
	E	10	10	9	1	0	0
Comments:							

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
214-217	282-284, 274

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.2	8.3	6.8	6.5	6.2	7.89	7.84	7.88	7.73	7.70	21.19	20	18	19	19	28.4	29	30	30	31	/	/	/	/	/	/
10 %	A	8.1	8.3	6.9	6.4	6.5	7.86	7.92	8.01	7.91	7.91	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/	
50 %	A	7.7	8.0	6.9	6.4	6.4	7.77	8.00	8.17	8.18	8.18	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/	
100 %	A	7.5	7.7	6.7	6.8	/	7.63	8.02	8.23	8.31	/	21	20	18	19	/	28	29	30	31	/	/	/	/	/		
Initials		LAI	LAI	CFS	LAI	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2					
Date		10/24	10/27	10/28	10/29	10/30	Exposure (Hours)										DO Meter #					DO Meter #					
Time		1300	1145	1320	1540	1015	0 24 48 72 96										DO Probe #					DO Probe #					
Incub. Temp		26	26	20	21	21	Water Quality Station #										pH Meter #					pH Meter #					
FEEDING: <i>Artemia nauplii</i>		(A-5179)					Thermometer or Probe #										pH Probe #					pH Probe #					
Fed By:		CFS	MW	GKS	MS	/	Initial										Salinity Meter #					Salinity Meter #					

12/12 BG (EW) water quality station and thermometer overhauled on 10/26.

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 Project: New Haven Client: AECOM Incubator ID: _____
 Test Species: *Menidia beryllina* Lot ID: 08MbAR0 102418 Sample: Composite #2 Diluent: CLDS

SURVIVAL - Composite # 2

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	9

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	9	8
	B	10	10	10	10	10	10
	C	10	10	10	10	8	8
	D	10	10	10	10	8	8
	E	10	10	10	10	8	7
100 %	A	10	10	10	5	0	0
	B	10	10	10	2	0	0
	C	10	10	10	0	0	0
	D	10	10	10	4	0	0
	E	10	10	10	4	0	0

Initials	MW	GRS	MW	LAG	MT	MW
Date	10/26/18	10/26/18	10/27/18	10/28	10/29	10/30
Time	1500	1540	1312	1500	1640	1305

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
218-221	286-288 , 275
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.2	6.8	7.1	6.9	6.6	7.89	7.83	7.90	7.78	7.81	19	20	18	19	19	28	29	30	29	30	/	/	/	/	/
10 %	A	8.1	6.7	7.0	6.9	6.2	7.88	7.91	8.00	7.94	7.91	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/
50 %	A	7.7	6.6	7.0	6.7	6.1	7.82	8.00	8.20	8.19	8.18	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/
100 %	A	7.0	6.6	6.8	5.8	/	7.74	8.03	8.25	8.26	/	20	20	18	19	/	28	29	30	30	/	/	/	/	/	

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.2	6.8	7.1	6.9	6.6	7.89	7.83	7.90	7.78	7.81	19	20	18	19	19	28	29	30	29	30	/	/	/	/	/
10 %	A	8.1	6.7	7.0	6.9	6.2	7.88	7.91	8.00	7.94	7.91	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/
50 %	A	7.7	6.6	7.0	6.7	6.1	7.82	8.00	8.20	8.19	8.18	19	20	18	19	19	28	29	30	30	31	/	/	/	/	/
100 %	A	7.0	6.6	6.8	5.8	/	7.74	8.03	8.25	8.26	/	20	20	18	19	/	28	29	30	30	/	/	/	/	/	

Initials	MT	LAG	CFS	LAG	MT
Date	10/26	10/27	10/28	10/29	10/30
Time	1355	1210	1330	1635	1015
Incub. Temp	21	24	21	21	21

RECORD OF METERS USED						Water Quality Station #1		Water Quality Station #2	
Exposure (Hours)						DO Meter #	MLO2	DO Meter #	MLO1
						DO Probe #	160	DO Probe #	96
Water Quality Station #						pH Meter #	MLO2	pH Meter #	MLO1
Thermometer or Probe #						pH Probe #	163	pH Probe #	158
Initial						Salinity Meter #	MLO2	Salinity Meter #	MLO1

FEEDING: Artemia nauplii (A-5179)
 Fed By: MW MW GRS MS

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102418 **Sample:** Composite #6 **Diluent:** CLDS

SURVIVAL - Composite # 6

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	9	7	7	7
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	9	9	9	9
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		MW	CFS	MW	LAG	MT	MW
Date		10/26	10/26	10/27	10/28	10/29	10/30
Time		1555	2005	1355	1515	1640	1355

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
222-225	290-293

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.0	6.7	6.9	7.0	6.7	7.93	7.78	7.88	7.82	7.81	19	19	18	19	19	28	28	30	30	31						
10 %	A	8.1	7.0	7.0	6.9	6.7	7.91	7.93	7.97	7.89	7.89	19	20	18	19	19	28	29	30	30	31						
50 %	A	8.0	7.1	7.0	6.9	6.6	7.96	7.98	8.08	8.07	8.07	19	20	18	19	19	28	29	31	30	31						
100 %	A	7.4	7.0	6.8	6.9	6.6	7.98	8.01	8.17	8.20	8.20	19	20	19	19	19	28	29	31	30	32						

RECORD OF METERS USED

		Exposure (Hours)					Water Quality Station #1		Water Quality Station #2	
		0	24	48	72	96	DO Meter #	MLO2	DO Meter #	MLO1
Date	10/26/18	10/27	10/28	10/29	10/30		DO Probe #	160	DO Probe #	96
Time	1410	1226	1335	1645	1015		pH Meter #	MLO2	pH Meter #	MLO1
Incub. Temp	21	21	21	21	21		pH Probe #	163	pH Probe #	158
Initial	CFS	LAG	CFS	LAG	MT		Salinity Meter #	MLO2	Salinity Meter #	MLO1

FEEDING: *Artemia nauplii* (A-5179)

Fed By: CFS MW GRS MS

Assay Review Checklist

DATE IN: 10/26/18
 DATE DUE: _____

STUDY#: 31248
 CLIENT: NHH-2018
 PROJECT: AECOM
 ASSAY: M696SPP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/26/18	CFS	
Day 1	10/27/18	MW	
Day 2	10/28	LAG	
Day 3	10/29	MT	
Day 4	10/30	MW	
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/2/18	NR	
Statistical Analysis Reviewed	11/6/18	LF	
Data Acceptability Review	11/6/18	NR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LABFORMS\ Assay Review Checklist.wpd

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #: 31248 Incubator ID: 20
 Project: New Haven Client: AECOM

Composites 3, 4 & 5

Summary of Test Conditions

Exposure	Species Used
<p>Test Mode: Static, non-renewal</p> <p>Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i>: 96 hours <i>Arbacia</i>: 48-72 hours</p>	<p>(Check box for all that apply)</p> <p><input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>)</p> <p><input checked="" type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>)</p> <p><input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)</p>

Water Quality Parameters

<p>Salinity: <i>A. bahia</i> and <i>M. beryllina</i>: 30 ± 2 ppt <i>Arbacia</i>: 30 ± 2 ppt (3) NR 11/2/18</p> <p>pH: 7.8 ± 0.5</p>	<p>Temperature: <i>A. bahia</i> and <i>M. beryllina</i>: 20 ± 2 °C <i>Arbacia</i>: 16 ± 2 °C 20 ± 1 °C (3) NR 11/2/18</p> <p>Photoperiod: 16 hour light, 8 hour dark</p>
--	---

Test Chamber	Solution Volume
<p>(Check box for all that apply)</p> <p><input type="checkbox"/> 250 mL beaker</p> <p><input type="checkbox"/> 600 mL beaker</p> <p><input checked="" type="checkbox"/> other 200ml Tumbler</p>	<p>(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 200 mL/replicate</p> <p><input type="checkbox"/> 400 mL/replicate</p> <p><input type="checkbox"/> other _____</p>

Replicate Information

<p><i>A. bahia</i> and <i>M. beryllina</i>:</p> <ul style="list-style-type: none"> • 5 Reps per treatment • 10 organisms per chamber 	<p><i>Arbacia</i>:</p> <ul style="list-style-type: none"> • 5 Reps per treatment • 20-30 embryos/mL
--	---

Cleaning	Treatments
<p>Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).</p>	<p>Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)</p>

Feeding

<p><i>A. bahia</i>:</p> <p>Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day</p>	<p><i>M. beryllina</i>:</p> <p>Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day</p>
<p><i>Arbacia</i>: NONE</p>	

Date: 10/26/18

Initial BG



ES 10124
CSARO MBAR0102418

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species MENIDIA BERYLLINA

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10-16-18 Receipt date _____

Lot number 101318 MB Strain _____

Brood origination CAPE COD MA

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. _____ ppm

pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers YCT _____ Other ENCAS SHRIMP DIET

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: EST / ENTKALPY # of Organisms 2800+

Carrier: _____ Date shipped 10-24-18

Biologist: Mark [Signature]

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven
ASSAY: MB96SPP
SPECIES: *M. beryllina*
TASK: Wet Weight Data - Balance Output File
BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 1124024313

Date / Initials:	10/25/18	GRS
Rep		
1		0.00546
2		0.00414
3		0.00636
4		0.00218
5		0.00336
6		0.00176
7		0.00147
8		0.00214
9		0.00202
10		0.00286
11		0.00232
12		0.00345
13		0.00338
14		0.00585
15		0.00222
16		0.00169
17		0.00114
18		0.00174
19		0.00105
20		0.00333
Mean Weight (g):		0.00290
Test Volume (L):		0.2
Loading Rate(g/L):		0.14480

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08 Mb ARD 102418 **Sample:** Controls **Diluent:** CLDS

SURVIVAL - Controls - beakers															
Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB control water)	A	10	10	10	10	10	8	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	9		B	10	10	10	10	10	10
	C	10	10	10	10	10	9		C	10	10	10	10	10	10
	D	10	10	10	10	10	10		D	10	10	10	10	10	9
	E	10	10	10	10	10	9		E	10	10	10	10	10	10
Initials		MW	GRS	MW	LAG	LAG	MW	Comments:							
Date		10/26/18	10/26/18	10/27	10/28	10/29	10/30								
Time		1710	1835	1630	1625	1750	1311								

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
-226	-298
-227	-299
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
LAB	A	8.8	6.9	7.2	7.2	7.1	7.97	7.87	7.90	7.81	7.86	22	20	18	17	18	30.3	32	32	32	33	/	/	/	/	/
(RW)	A	10.1	7.0	7.4	7.1	7.2	7.88	7.84	7.92	7.81	7.82	20	20	18	18	18	27.5	29	30	29	31	/	/	/	/	/
Initials	LCI	LCI	CFS	LAG	MJ	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2					
Date	10/26	10/27	10/28	10/29	10/30	Exposure (Hours)										DO Meter #		MLO2	DO Meter #		MLO1					
Time	1635	1308	1435	1700	1120						0	24	48	72	96	DO Probe #		160	DO Probe #		96					
Incub. Temp	26.21	21	21	21	21	Water Quality Station #					2	1	1	2	1	pH Meter #		MLO2	pH Meter #		MLO1					
FEEDING: <i>Artemia nauplii</i> (A-5179)						Thermometer or Probe #					159	1	1	MLO1	MLO2	pH Probe #		163	pH Probe #		158					
Fed By:	CFS	MW	LAG	LAG	/	Initial					LCI	LCI	CFS	LAG	MJ	Salinity Meter #		MLO2	Salinity Meter #		MLO1					

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08MBARD102418 **Sample:** Composite #3 **Diluent:** CLDS

SURVIVAL - Composite #1 (E3) NR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	7	0	0
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	9	9	9
	E	10	10	10	9	9	9

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	9	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	9	8
	D	10	10	10	10	10	9
	E	10	10	10	10	9	9
100 %	A	10	10	9	23	0	0
	B	10	10	8	1	0	0
	C	10	10	10	3	0	0
	D	10	10	10	6	0	0
	E	10	10	10	3	6	0

Initials	MW	CFS	MW	LAG	LAG	MW
Date	10/26/18	10/26	10/27	10/28	10/29	10/30
Time	1830	1935	1632	1635	1755	1630

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
228-231	300-302, 330
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt = 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.8	7.3	8.2	7.3	7.4	7.86	7.95	7.94	7.81	7.88	20.4	19	15	18	18	39.25	29	30	30	32					
10 %	A	9.7	7.0	8.3	7.3	7.2	7.82	7.92	8.01	7.49	7.99	20.0	19	14	17	18	39.28	29	30	30	32					
50 %	A	9.4	7.1	8.2	7.3	7.1	7.73	7.98	8.17	8.18	8.20	20.2	19	14	17	18	39.23	29	31	31	33					
100 %	A	8.6	7.1	8.0	7.3		7.69	8.01	8.24	8.27		19.8	19	14	17		40.27	30	32	32						

Initials		RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2								
Date	10/26	10/27	10/28	10/29	10/30	Exposure (Hours)					DO Meter #					DO Meter #				
Time	1805	1805	1445	1705	1120	0	24	48	72	96	DO Probe #					DO Probe #				
Incub. Temp	21	21	21	21	21	Water Quality Station #					pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)						Thermometer or Probe #					pH Probe #					pH Probe #				
Fed By:	CFS	MW	LAG	LAG		Initial					Salinity Meter #					Salinity Meter #				

(E10) water quality station used overlooked
 (E11) information written accidentally on hour 24 instead of 96.
 (E2) LAG 1211 water quality station used overlooked.

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 Project: New Haven Client: AECOM Incubator ID:
 Test Species: *Menidia beryllina* Lot ID: 08M6ARO 102418 Sample: Composite #4 Diluent: CLDS

SURVIVAL - Composite #1 (E) NR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	9	8
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	9
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		MW	CFS	MW	LAG	LAG	MW
Date		10/26/18	10/26	10/27	10/28	10/29	10/30
Time		1730	1930	1643	1700	1800	1530

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	9	8	8
	E	10	10	10	10	10	10
100 %	A	10	10	10	3	0	0
	B	10	10	10	8	2	1
	C	10	10	8	3	0	0
	D	10	10	10	4	0	0
	E	10	10	9	3	0	0
Initials							
Date							
Time							

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
232-235	304-307
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.8	6.7	7.7	7.3	7.1	7.83	7.80	7.87	7.85	7.85	18.4	19	16	17	19	27.5	29	30	30	32					
10 %	A	9.6	6.9	7.7	7.3	7.1	7.85	7.91	7.99	7.97	8.00	19.3	19	16	17	19	27.9	29	30	31	32					
50 %	A	9.3	6.9	7.6	7.2	7.2	7.80	7.97	8.14	8.17	8.20	19.6	19	16	17	19	28.0	29	31	31	32					
100 %	A	8.7	6.9	7.3	7.2	7.4	7.76	8.02	8.23	8.29	8.30	20.0	19	17	17	18	28.1	29	31	31	32					

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED						Water Quality Station #1		Water Quality Station #2	
				Exposure (Hours)						DO Meter #	MLO2	DO Meter #	MLO1
				0	24	48	72	96	DO Probe #	160	DO Probe #	96	
				Water Quality Station #	2	2	1	2	1	pH Meter #	MLO2	pH Meter #	MLO1
				Thermometer or Probe #	159	159	1	MLO1	MLO2	pH Probe #	163	pH Probe #	158
				Initial	LCJ	LAG	CFS	LAG	MT	Salinity Meter #	MLO2	Salinity Meter #	MLO1

FEEDING: *Artemia nauplii* (A-5179)
 Fed By: CFS MW LAG LAG

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08M6ARD102418 **Sample:** Composite #5 **Diluent:** CLDS

SURVIVAL - Composite #1 (E) MR 11/2/18

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	9	8	8	8
	E	10	10	10	10	9	9

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	9	8	8
	B	10	10	10	10	9	9
	C	10	10	10	10	10	10
	D	10	10	10	9	8	8
	E	10	10	10	10	10	10
100 %	A	10	10	9	0	0	0
	B	10	10	6	0	0	0
	C	10	10	8	0	0	0
	D	10	10	10	0	0	0
	E	10	10	10	0	0	0

Initials	MW	CFS	MW	LAG	GRS	MW
Date	10/26/18	10/26	10/27	10/28	10/29/18	10/30
Time	1745	1950	1647	1710	1800	1545

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
236-239	308-310, 245
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

Comments:

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	9.6	7.2	7.6	7.1	7.2	7.98	7.87	7.84	7.85	7.88	18.9	19	16	18	18	27.9	30	30	30	31					
10 %	A	9.6	7.3	7.6	7.2	7.2	7.83	7.94	7.99	8.00	8.01	19.1	19	15	17	18	28.0	30	30	36	32					
50 %	A	9.2	7.4	7.6	7.2	7.3	7.68	8.00	8.18	8.22	8.22	19.2	19	15	17	18	28.3	30	31	31	32					
100 %	A	8.8	6.6	7.1			7.66	8.03	8.25			19.2	19	15			28.7	30	31							

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED						Water Quality Station #1		Water Quality Station #2	
				Exposure (Hours)						DO Meter #	ML02	DO Meter #	ML01
				0	24	48	72	96	DO Probe #	160	DO Probe #	15896	
				Water Quality Station #	2	1	1	2	1	pH Meter #	ML02	pH Meter #	ML01
				Thermometer or Probe #	159	1	1	ML01	ML02	pH Probe #	163	pH Probe #	96 158
				Initial	LCI	LCI	CFS	LAG	MT	Salinity Meter #	ML02	Salinity Meter #	ML01

FEEDING: Artemia nauplii (A-5 T9)
Fed By: CFS MW LAG LAG

Assay Review Checklist

DATE IN: 10/26/18
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: NHH-2018
 ASSAY: Mb96SPP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/26/18	CFS	
Day 1	10/27/18	MW	
Day 2	10/28	LAG	
Day 3	10/29/18	GRS	
Day 4			
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/2/18	MR	
Statistical Analysis Reviewed	11/6/18	LF	
Data Acceptability Review	11/6/18	MR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LAB\FORMS\ Assay Review Checklist.wpd

Menidia beryllina
Suspended Particulate Phase
Statistical Analysis Reports
Survival
Unmitigated Assays

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:14 (p 1 of 1)
Test Code/ID: 14-2857-5239/31248Mb-Comp1

Menidia beryllina 96-h Acute Survival Test					EnviroSystems, Inc.						
Start Date:	26 Oct-18 14:30	Species:	Menidia beryllina	Sample Code:	31246-101						
End Date:	30 Oct-18 12:53	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	25 Oct-18 13:10	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V,W')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	6	10				10			
0	LS	2	10	10				10			
0	LS	3	18	10				9			
0	LS	4	24	10				10			
0	LS	5	29	10				9			
0	R	1	4	10				10			
0	R	2	12	10				10			
0	R	3	15	10				10			
0	R	4	23	10				9			
0	R	5	27	10				10			
1		1	3	10				10			
1		2	11	10				10			
1		3	14	10				10			
1		4	20	10				10			
1		5	30	10				10			
10		1	1	10				10			
10		2	7	10				10			
10		3	13	10				10			
10		4	19	10				10			
10		5	28	10				10			
50		1	5	10				9			
50		2	8	10				10			
50		3	17	10				8			
50		4	22	10				10			
50		5	26	10				9			
100		1	2	10				0			
100		2	9	10				0			
100		3	16	10				0			
100		4	21	10				0			
100		5	25	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:14 (p 1 of 1)
Test Code: 31248Mb-Comp1 | 14-2857-5239

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 01-6326-0175	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 14:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 12:53	Species: Menidia beryllina	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 10-9651-6502	Code: 31246-101	Client: AECOM
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018	
Sample Age: 25h	Station: Comp 1 Elutriate (V,W')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
04-0435-2581	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	69.7	67.6	71.3	1.436	
18-7922-6412	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	68.8	65.9	71.2	1.453	
09-3280-4033	96h Proportion Survived	Spearman-Kärber	EC50	67.2	62.4	72.4	1.487	
10-4395-2859	96h Proportion Survived	Spearman-Kärber	EC50	64.9	59.6	70.7	1.54	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-2.08%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-4.17%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-4.17%
50		5	0.920	0.816	1.000	0.800	1.000	0.037	0.084	9.09%	4.17%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	0.900	1.000	0.900
0	R	1.000	1.000	1.000	0.900	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	1.000
50		0.900	1.000	0.800	1.000	0.900
100		0.000	0.000	0.000	0.000	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:14 (p 1 of 1)
Test Code: 31248Mb-Comp1 | 14-2857-5239

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 09-3280-4033		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:55		Analysis: Untrimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 10-9651-6502		Code: 31246-101			Client: AECOM						
Sample Date: 25 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 25h		Station: Comp 1 Elutriate (V,W')									
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	0.00%	1.83	0.0161	67.2	62.4	72.4				
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.993	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
10		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
50		4	0.950	0.900	1.000	0.058	6.08%	3.06%	38/40	0.95	4.36%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	1.000					
50		0.900	1.000	Outlier	1.000	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:14 (p 1 of 2)
Test Code: 31248Mb-Comp1 | 14-2857-5239

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 18-7922-6412		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:55		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 10-9651-6502		Code: 31246-101			Client: AECOM						
Sample Date: 25 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 25h		Station: Comp 1 Elutriate (V,W')									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	160616	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.96	2.82	0.0262	Outlier Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	68.8	65.9	71.2	1.453	1.404	1.517					
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.993	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
10		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
50		5	0.920	0.800	1.000	0.084	9.09%	6.12%	46/50	0.92	7.38%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	1.000					
50		0.900	1.000	0.800	1.000	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:14 (p 2 of 2)
Test Code: 31248Mb-Comp1 | 14-2857-5239

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 04-0435-2581	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:55	Analysis: Linear Interpolation (ICPIN)				Official Results: Yes						
Sample ID: 10-9651-6502	Code: 31246-101				Client: AECOM						
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 25h	Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	696372	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	69.7	67.6	71.3	1.436	1.402	1.48					
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.993	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
10		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.993	0.0%
50		4	0.950	0.900	1.000	0.058	6.08%	3.06%	38/40	0.95	4.36%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	1.000					
50		0.900	1.000	Outlier	1.000	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:15 (p 1 of 1)
Test Code/ID: 17-0851-6428/31248Mb-Comp2

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	26 Oct-18 14:30	Species:	Menidia beryllina	Sample Code:	31246-103						
End Date:	30 Oct-18 12:53	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	25 Oct-18 17:00	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	5	10				10			
0	LS	2	8	10				10			
0	LS	3	14	10				9			
0	LS	4	21	10				10			
0	LS	5	27	10				9			
0	R	1	1	10				10			
0	R	2	10	10				10			
0	R	3	16	10				10			
0	R	4	19	10				9			
0	R	5	25	10				10			
1		1	3	10				10			
1		2	12	10				10			
1		3	17	10				10			
1		4	23	10				10			
1		5	30	10				10			
10		1	2	10				10			
10		2	7	10				10			
10		3	18	10				10			
10		4	24	10				10			
10		5	26	10				9			
50		1	6	10				8			
50		2	9	10				10			
50		3	13	10				8			
50		4	22	10				8			
50		5	28	10				7			
100		1	4	10				0			
100		2	11	10				0			
100		3	15	10				0			
100		4	20	10				0			
100		5	29	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:15 (p 1 of 1)
Test Code: 31248Mb-Comp2 | 17-0851-6428

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 01-6326-0175	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 14:30	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 12:53	Species: Menidia beryllina	Brine: Not Applicable
Duration: 94h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 09-3501-8494	Code: 31246-103	Client: AECOM
Sample Date: 25 Oct-18 17:00	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 17:00	Source: New Haven Harbor 2018	
Sample Age: 21h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
10-8584-4772	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	65.9	62.2	69.5	1.518	
19-2963-5879	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	64.3	61.2	66	1.556	
03-1415-6896	96h Proportion Survived	Spearman-Kärber	EC50	56.9	49.7	65.1	1.758	
20-6742-2686	96h Proportion Survived	Spearman-Kärber	EC50	54	46	63.4	1.852	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-2.08%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-4.17%
10		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-2.08%
50		5	0.820	0.684	0.956	0.700	1.000	0.049	0.110	13.36%	14.58%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	1.000	1.000	0.900	1.000	0.900
0	R	1.000	1.000	1.000	0.900	1.000
1		1.000	1.000	1.000	1.000	1.000
10		1.000	1.000	1.000	1.000	0.900
50		0.800	1.000	0.800	0.800	0.700
100		0.000	0.000	0.000	0.000	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:15 (p 1 of 1)
Test Code: 31248Mb-Comp2 | 17-0851-6428

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 20-6742-2686		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:57		Analysis: Untrimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 09-3501-8494		Code: 31246-103			Client: AECOM						
Sample Date: 25 Oct-18 17:00		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 17:00		Source: New Haven Harbor 2018									
Sample Age: 21h		Station: Comp 2 Elutriate (R',S')									
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	0.00%	1.73	0.0347	54	46	63.4				
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.99	0.0%
10		5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	1.01%
50		4	0.775	0.700	0.800	0.050	6.45%	20.9%	31/40	0.775	21.7%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		1.000	1.000	1.000	1.000	0.900					
50		0.800	Outlier	0.800	0.800	0.700					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:15 (p 1 of 1)
Test Code: 31248Mb-Comp2 | 17-0851-6428

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 19-2963-5879		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:57		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 09-3501-8494		Code: 31246-103			Client: AECOM							
Sample Date: 25 Oct-18 17:00		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 17:00		Source: New Haven Harbor 2018										
Sample Age: 21h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	60657	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	64.3	61.2	66	1.556	1.514	1.633						
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%	
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.99	0.0%	
10		5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	1.01%	
50		4	0.775	0.700	0.800	0.050	6.45%	20.9%	31/40	0.775	21.7%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	0.900	1.000						
1		1.000	1.000	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	0.900						
50		0.800	Outlier	0.800	0.800	0.700						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:16 (p 1 of 1)
Test Code/ID: 01-2260-0424/31248Mb-Comp3

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	26 Oct-18 17:10	Species:	Menidia beryllina	Sample Code:	31246-105						
End Date:	30 Oct-18 13:11	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	26 Oct-18 16:15	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				8			
0	LS	2	12	10				9			
0	LS	3	17	10				9			
0	LS	4	19	10				10			
0	LS	5	30	10				9			
0	R	1	5	10				10			
0	R	2	10	10				10			
0	R	3	13	10				10			
0	R	4	21	10				9			
0	R	5	29	10				10			
1		1	6	10				10			
1		2	11	10				10			
1		3	18	10				0			
1		4	23	10				10			
1		5	26	10				10			
10		1	2	10				9			
10		2	8	10				10			
10		3	15	10				10			
10		4	24	10				9			
10		5	27	10				9			
50		1	4	10				9			
50		2	9	10				10			
50		3	14	10				8			
50		4	20	10				9			
50		5	28	10				9			
100		1	1	10				0			
100		2	7	10				0			
100		3	16	10				0			
100		4	22	10				0			
100		5	25	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:16 (p 1 of 1)
Test Code: 31248Mb-Comp3 | 01-2260-0424

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 01-7364-8859	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 17:10	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 13:11	Species: Menidia beryllina	Brine: Not Applicable
Duration: 92h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 16-4987-4855	Code: 31246-105	Client: AECOM
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018	
Sample Age: 55m	Station: Comp 3 Elutriate (US-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
14-8261-7479	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	68.4	65.4	70.6	1.463	
19-5195-8413	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	68	62.1	70.3	1.47	
21-0105-2704	96h Proportion Survived	Spearman-Kärber	EC50	57.7	49.5	67.2	1.733	✓
13-8998-6039	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	68	65.5	70.5	1.471	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
1		5	0.800	0.245	1.000	0.000	1.000	0.200	0.447	55.90%	11.11%
10		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	-4.44%
50		5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	0.900	1.000	0.900
0	R	1.000	1.000	1.000	0.900	1.000
1		1.000	1.000	0.000	1.000	1.000
10		0.900	1.000	1.000	0.900	0.900
50		0.900	1.000	0.800	0.900	0.900
100		0.000	0.000	0.000	0.000	0.000

CETIS Analytical Report

Report Date: 08 Nov-18 16:19 (p 1 of 1)
Test Code: 31248Mb-Comp3 | 01-2260-0424

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 13-8998-6039		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:59		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 16-4987-4855		Code: 31246-105			Client: AECOM						
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018									
Sample Age: 55m		Station: Comp 3 Elutriate (US-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	10.20%	1.83	0.00799	68	65.5	70.5				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	4.22	2.82	1.7E-07	Outlier Detected						
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)						Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	0.0%
1		5	0.800	0.000	1.000	0.447	55.90%	18.4%	40/50	0.88	10.2%
10		5	0.940	0.900	1.000	0.055	5.83%	4.08%	47/50	0.88	10.2%
50		5	0.900	0.800	1.000	0.071	7.86%	8.16%	45/50	0.88	10.2%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	0.000	1.000	1.000					
10		0.900	1.000	1.000	0.900	0.900					
50		0.900	1.000	0.800	0.900	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:16 (p 1 of 1)
Test Code: 31248Mb-Comp3 | 01-2260-0424

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 21-0105-2704	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 9:59	Analysis: Untrimmed Spearman-Kärber				Official Results: Yes						
Sample ID: 16-4987-4855	Code: 31246-105				Client: AECOM						
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 55m	Station: Comp 3 Elutriate (US-1,-2)										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	0.00%	1.76	0.0332	57.7	49.5	67.2				
96h Proportion Survived Summary			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%
1		4	1.000	1.000	1.000	0.000	0.00%	-2.04%	40/40	0.99	0.0%
10		5	0.940	0.900	1.000	0.055	5.83%	4.08%	47/50	0.94	5.05%
50		5	0.900	0.800	1.000	0.071	7.86%	8.16%	45/50	0.9	9.09%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	Outlier	1.000	1.000					
10		0.900	1.000	1.000	0.900	0.900					
50		0.900	1.000	0.800	0.900	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:16 (p 1 of 2)
Test Code: 31248Mb-Comp3 | 01-2260-0424

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Analysis ID: 19-5195-8413		Endpoint: 96h Proportion Survived		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:58		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Sample ID: 16-4987-4855		Code: 31246-105		Client: AECOM							
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018									
Sample Age: 55m		Station: Comp 3 Elutriate (US-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1274472	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	4.22	2.82	1.7E-07	Outlier Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	68	62.1	70.3	1.47	1.422	1.61					
96h Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	0.0%
1		5	0.800	0.000	1.000	0.447	55.90%	18.4%	40/50	0.88	10.2%
10		5	0.940	0.900	1.000	0.055	5.83%	4.08%	47/50	0.88	10.2%
50		5	0.900	0.800	1.000	0.071	7.86%	8.16%	45/50	0.88	10.2%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	0.000	1.000	1.000					
10		0.900	1.000	1.000	0.900	0.900					
50		0.900	1.000	0.800	0.900	0.900					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:16 (p 2 of 2)
Test Code: 31248Mb-Comp3 | 01-2260-0424

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 14-8261-7479		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 9:58		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 16-4987-4855		Code: 31246-105			Client: AECOM							
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018										
Sample Age: 55m		Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	304840	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	68.4	65.4	70.6	1.463	1.417	1.529						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%	
1		4	1.000	1.000	1.000	0.000	0.00%	-2.04%	40/40	0.99	0.0%	
10		5	0.940	0.900	1.000	0.055	5.83%	4.08%	47/50	0.94	5.05%	
50		5	0.900	0.800	1.000	0.071	7.86%	8.16%	45/50	0.9	9.09%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	0.900	1.000						
1		1.000	1.000	Outlier	1.000	1.000						
10		0.900	1.000	1.000	0.900	0.900						
50		0.900	1.000	0.800	0.900	0.900						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:16 (p 1 of 1)
Test Code/ID: 09-8334-2126/31248Mb-Comp4

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date: 26 Oct-18 17:10		Species: Menidia beryllina				Sample Code: 31246-107					
End Date: 30 Oct-18 13:11		Protocol: EPA/821/R-02-012 (2002)				Sample Source: New Haven Harbor 2018					
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution				Sample Station: Comp 4 Elutriate (DS-1,-2)					

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	5	10				8			
0	LS	2	9	10				9			
0	LS	3	15	10				9			
0	LS	4	24	10				10			
0	LS	5	29	10				9			
0	R	1	2	10				10			
0	R	2	12	10				10			
0	R	3	17	10				10			
0	R	4	19	10				9			
0	R	5	28	10				10			
1		1	1	10				10			
1		2	8	10				10			
1		3	16	10				10			
1		4	23	10				10			
1		5	27	10				8			
10		1	6	10				10			
10		2	11	10				9			
10		3	13	10				10			
10		4	22	10				10			
10		5	25	10				10			
50		1	4	10				9			
50		2	7	10				10			
50		3	14	10				10			
50		4	20	10				8			
50		5	30	10				10			
100		1	3	10				0			
100		2	10	10				1			
100		3	18	10				0			
100		4	21	10				0			
100		5	26	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:17 (p 1 of 1)
Test Code: 31248Mb-Comp4 | 09-8334-2126

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 01-7364-8859	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 17:10	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 13:11	Species: Menidia beryllina	Brine: Not Applicable
Duration: 92h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 04-7608-3506	Code: 31246-107	Client: AECOM
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
00-8507-1599	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	70.2	66.1	72.6	1.424	
15-1336-9750	96h Proportion Survived	Trimmed Spearman-Kärber	EC50	69.4	64.4	74.8	1.441	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
1		5	0.960	0.849	1.000	0.800	1.000	0.040	0.089	9.32%	-6.67%
10		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
50		5	0.940	0.829	1.000	0.800	1.000	0.040	0.089	9.52%	-4.44%
100		5	0.020	0.000	0.076	0.000	0.100	0.020	0.045	223.61%	97.78%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	0.900	1.000	0.900
0	R	1.000	1.000	1.000	0.900	1.000
1		1.000	1.000	1.000	1.000	0.800
10		1.000	0.900	1.000	1.000	1.000
50		0.900	1.000	1.000	0.800	1.000
100		0.000	0.100	0.000	0.000	0.000

CETIS Analytical Report

Report Date: 07 Nov-18 14:17 (p 1 of 1)
Test Code: 31248Mb-Comp4 | 09-8334-2126

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 15-1336-9750		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:00		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 04-7608-3506		Code: 31246-107			Client: AECOM						
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 4h		Station: Comp 4 Elutriate (DS-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	2.04%	1.84	0.0162	69.4	64.4	74.8				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.58	2.82	0.1376	No Outliers Detected						
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)						Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	0.0%
1		5	0.960	0.800	1.000	0.089	9.32%	2.04%	48/50	0.97	1.02%
10		5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.97	1.02%
50		5	0.940	0.800	1.000	0.089	9.52%	4.08%	47/50	0.94	4.08%
100		5	0.020	0.000	0.100	0.045	224.00%	98.0%	1/50	0.02	98.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	0.800					
10		1.000	0.900	1.000	1.000	1.000					
50		0.900	1.000	1.000	0.800	1.000					
100		0.000	0.100	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:17 (p 1 of 1)
Test Code: 31248Mb-Comp4 | 09-8334-2126

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 00-8507-1599		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:00		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7608-3506		Code: 31246-107			Client: AECOM							
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1145294	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.58	2.82	0.1376	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	70.2	66.1	72.6	1.424	1.377	1.512						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	0.0%	
1		5	0.960	0.800	1.000	0.089	9.32%	2.04%	48/50	0.97	1.02%	
10		5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.97	1.02%	
50		5	0.940	0.800	1.000	0.089	9.52%	4.08%	47/50	0.94	4.08%	
100		5	0.020	0.000	0.100	0.045	224.00%	98.0%	1/50	0.02	98.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	0.900	1.000						
1		1.000	1.000	1.000	1.000	0.800						
10		1.000	0.900	1.000	1.000	1.000						
50		0.900	1.000	1.000	0.800	1.000						
100		0.000	0.100	0.000	0.000	0.000						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:17 (p 1 of 1)
Test Code/ID: 05-8212-5063/31248Mb-Comp5

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date: 26 Oct-18 17:10		Species: Menidia beryllina				Sample Code: 31246-109					
End Date: 30 Oct-18 13:11		Protocol: EPA/821/R-02-012 (2002)				Sample Source: New Haven Harbor 2018					
Sample Date: 26 Oct-18 15:25		Material: Elutriate Solution				Sample Station: Comp 5 Elutriate (TB-1,-2)					

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	5	10				8			
0	LS	2	8	10				9			
0	LS	3	16	10				9			
0	LS	4	19	10				10			
0	LS	5	27	10				9			
0	R	1	3	10				10			
0	R	2	9	10				10			
0	R	3	17	10				10			
0	R	4	24	10				9			
0	R	5	28	10				10			
1		1	6	10				10			
1		2	7	10				10			
1		3	14	10				10			
1		4	21	10				10			
1		5	29	10				10			
10		1	4	10				9			
10		2	12	10				10			
10		3	13	10				10			
10		4	22	10				8			
10		5	25	10				9			
50		1	2	10				8			
50		2	11	10				9			
50		3	18	10				10			
50		4	23	10				8			
50		5	26	10				10			
100		1	1	10				0			
100		2	10	10				0			
100		3	15	10				0			
100		4	20	10				0			
100		5	30	10				0			

CETIS Summary Report

Report Date: 07 Nov-18 14:18 (p 1 of 1)
Test Code: 31248Mb-Comp5 | 05-8212-5063

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 01-7364-8859	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 26 Oct-18 17:10	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 13:11	Species: Menidia beryllina	Brine: Not Applicable
Duration: 92h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 02-4334-9766	Code: 31246-109	Client: AECOM
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018	
Sample Age: 105m	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
03-5814-5184	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	68.4	65.6	70.5	1.463	
19-2874-8105	96h Proportion Survived	Spearman-Kärber	EC50	55.5	46.8	65.7	1.803	✓

96h Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
1		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
10		5	0.920	0.816	1.000	0.800	1.000	0.037	0.084	9.09%	-2.22%
50		5	0.900	0.776	1.000	0.800	1.000	0.045	0.100	11.11%	0.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

96h Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.800	0.900	0.900	1.000	0.900	
0	R	1.000	1.000	1.000	0.900	1.000	
1		1.000	1.000	1.000	1.000	1.000	
10		0.900	1.000	1.000	0.800	0.900	
50		0.800	0.900	1.000	0.800	1.000	
100		0.000	0.000	0.000	0.000	0.000	

CETIS Analytical Report

Report Date: 07 Nov-18 14:18 (p 1 of 1)
Test Code: 31248Mb-Comp5 | 05-8212-5063

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 19-2874-8105	Endpoint: 96h Proportion Survived				CETIS Version: CETISv1.9.3				Official Results: Yes		
Analyzed: 07 Nov-18 10:01	Analysis: Untrimmed Spearman-Kärber										
Sample ID: 02-4334-9766	Code: 31246-109				Client: AECOM						
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution				Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018										
Sample Age: 105m	Station: Comp 5 Elutriate (TB-1,-2)										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.02	0.00%	1.74	0.0369	55.5	46.8	65.7				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.06	2.82	0.8091	No Outliers Detected						
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.99	0.0%
10		5	0.920	0.800	1.000	0.084	9.09%	6.12%	46/50	0.92	7.07%
50		5	0.900	0.800	1.000	0.100	11.10%	8.16%	45/50	0.9	9.09%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		0.900	1.000	1.000	0.800	0.900					
50		0.800	0.900	1.000	0.800	1.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:17 (p 1 of 1)
Test Code: 31248Mb-Comp5 | 05-8212-5063

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 03-5814-5184		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:01		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 02-4334-9766		Code: 31246-109			Client: AECOM						
Sample Date: 26 Oct-18 15:25		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 15:25		Source: New Haven Harbor 2018									
Sample Age: 105m		Station: Comp 5 Elutriate (TB-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1301754	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.06	2.82	0.8091	No Outliers Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	68.4	65.6	70.5	1.463	1.419	1.524					
96h Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.99	0.0%
1		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.99	0.0%
10		5	0.920	0.800	1.000	0.084	9.09%	6.12%	46/50	0.92	7.07%
50		5	0.900	0.800	1.000	0.100	11.10%	8.16%	45/50	0.9	9.09%
100		5	0.000	0.000	0.000	0.000		100.0%	0/50	0	100.0%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	1.000	1.000	0.900	1.000					
1		1.000	1.000	1.000	1.000	1.000					
10		0.900	1.000	1.000	0.800	0.900					
50		0.800	0.900	1.000	0.800	1.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:18 (p 1 of 1)
Test Code/ID: 08-2426-7778/31248Mb-Comp6

Menidia beryllina 96-h Acute Survival Test					EnviroSystems, Inc.						
Start Date:	26 Oct-18 14:30	Species:	Menidia beryllina	Sample Code:	31246-111						
End Date:	30 Oct-18 12:53	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	25 Oct-18 15:20	Material:	Elutriate Solution	Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				10			
0	LS	2	12	10				10			
0	LS	3	16	10				9			
0	LS	4	21	10				10			
0	LS	5	29	10				9			
0	R	1	5	10				10			
0	R	2	8	10				10			
0	R	3	18	10				10			
0	R	4	20	10				9			
0	R	5	28	10				10			
1		1	4	10				7			
1		2	11	10				10			
1		3	17	10				10			
1		4	19	10				10			
1		5	25	10				9			
10		1	2	10				10			
10		2	9	10				10			
10		3	14	10				10			
10		4	22	10				10			
10		5	26	10				10			
50		1	1	10				10			
50		2	10	10				9			
50		3	15	10				10			
50		4	24	10				9			
50		5	27	10				8			
100		1	6	10				6			
100		2	7	10				8			
100		3	13	10				7			
100		4	23	10				9			
100		5	30	10				7			

CETIS Summary Report

Report Date: 07 Nov-18 14:19 (p 1 of 1)
Test Code: 31248Mb-Comp6 | 08-2426-7778

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Batch ID: 01-6326-0175	Test Type: Survival (96h)		Analyst: Nancy Roka			Start Date: 26 Oct-18 14:30		Protocol: EPA/821/R-02-012 (2002)		Diluent: CLDS Reference Site	
Ending Date: 30 Oct-18 12:53	Species: Menidia beryllina		Brine: Not Applicable			Duration: 94h		Source: ARO - Aquatic Research Organisms, NH		Age:	
Sample ID: 08-5165-6327	Code: 31246-111		Client: AECOM			Sample Date: 25 Oct-18 15:20		Material: Elutriate Solution		Project: Dredged Sediment Evaluation	
Receipt Date: 25 Oct-18 15:20	Source: New Haven Harbor 2018					Sample Age: 23h		Station: Comp 6 Elutriate (CAD-1,-2,-3)			
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method			Level	%	95% LCL	95% UCL	TU	✓	
19-3796-1521	96h Proportion Survived	Linear Interpolation (ICPIN)			EC50	>100	n/a	n/a	<1		
96h Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	0.00%
0	R	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-2.08%
1		5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	4.17%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-4.17%
50		5	0.920	0.816	1.000	0.800	1.000	0.037	0.084	9.09%	4.17%
100		5	0.740	0.598	0.882	0.600	0.900	0.051	0.114	15.41%	22.92%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	1.000	1.000	0.900	1.000	0.900					
0	R	1.000	1.000	1.000	0.900	1.000					
1		0.700	1.000	1.000	1.000	0.900					
10		1.000	1.000	1.000	1.000	1.000					
50		1.000	0.900	1.000	0.900	0.800					
100		0.600	0.800	0.700	0.900	0.700					

CETIS Analytical Report

Report Date: 07 Nov-18 14:19 (p 1 of 1)
Test Code: 31248Mb-Comp6 | 08-2426-7778

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 19-3796-1521		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:02		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 08-5165-6327		Code: 31246-111			Client: AECOM							
Sample Date: 25 Oct-18 15:20		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 15:20		Source: New Haven Harbor 2018										
Sample Age: 23h		Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	787098	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.72	2.82	0.0783	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.980	0.900	1.000	0.045	4.56%	0.0%	49/50	0.98	0.0%	
1		5	0.920	0.700	1.000	0.130	14.20%	6.12%	46/50	0.96	2.04%	
10		5	1.000	1.000	1.000	0.000	0.00%	-2.04%	50/50	0.96	2.04%	
50		5	0.920	0.800	1.000	0.084	9.09%	6.12%	46/50	0.92	6.12%	
100		5	0.740	0.600	0.900	0.114	15.40%	24.5%	37/50	0.74	24.5%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	1.000	1.000	0.900	1.000						
1		0.700	1.000	1.000	1.000	0.900						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	0.900	1.000	0.900	0.800						
100		0.600	0.800	0.700	0.900	0.700						

Menidia beryllina
Suspended Particulate Phase

Bench Sheets

Mitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY			
Study #:	31291	Incubator ID:	20
Project:	New Haven	Client:	AECOM
Composites 1, 2, 3, 4, 5 & 6			
Summary of Test Conditions			
Exposure		Species Used	
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours		(Check box for all that apply) <input checked="" type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input checked="" type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)	
Water Quality Parameters			
Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt pH: 7.8 ± 0.5		Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C Photoperiod: 16 hour light, 8 hour dark	
Test Chamber (Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL fumbler		Solution Volume (Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____	
Replicate Information			
<i>A. bahia</i> and <i>M. beryllina</i> : • 5 Reps per treatment • 10 organisms per chamber		<i>Arbacia</i> : • 5 Reps per treatment • 20-30 embryos/mL	
Cleaning		Treatments	
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).		Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)	
Feeding			
<i>A. bahia</i> : Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day		<i>M. beryllina</i> : Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day	
<i>Arbacia</i> : NONE			
Date: 10/31/18		Initial: [Signature]	



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species MENIDIA BERYLLINA
 Source: Lab reared Hatchery reared _____ Field collected _____
 Hatch date 10-21-18 Receipt date _____
 Lot number 101818MB Strain _____
 Brood origination CAPE COD MA

II. Water Quality

Temperature 25 °C Salinity ≈28 ppt D.O. _____ ppm
 pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____
 Recirculating Flow through _____ Static renewal _____
 DIET: Flake food Phytoplankton _____ Trout chow _____
 Artemia Rotifers YCT _____ Other ENCAP SHRIMP DIET
 Prophylactic treatments: _____
 Comments: _____

IV. Shipping Information

Client: EST # of Organisms 2800+
 Carrier: _____ Date shipped 10-29-18
 Biologist: Mark Dorenz

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

STUDY: 31291
CLIENT: AECOM
PROJECT: New Haven
ASSAY: Mb96AD
SPECIES: *M. beryllina*

BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 1124024313

Date / Intials: 10/31/18 MW MW

Rep

1	0.00361
2	0.00189
3	0.00345
4	0.00484
5	0.00469
6	0.00524
7	0.00429
8	0.00333
9	0.00147
10	0.0057
11	0.00322
12	0.0024
13	0.00626
14	0.00305
15	0.00328
16	0.00416
17	0.00396
18	0.00245
19	0.00178
20	0.00669

Mean Weight (g): 0.00379

Test Volume (L): 0.2

Loading Rate(g/L): 0.18940

COPY

PREPARATION of DILUTIONS

STUDY: 31291 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: ^{Ref} water		Composite #: 5	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	2000	0	2,000			0	2,000
(RW)	0	↓	0	↓			0	↓
1 %	20	↓	20	↓			20	↓
10 %	200	↓	200	↓			200	↓
50 %	1000	↓	1,000	↓			1,000	↓
100 %	2000	↓	2,000	↓			2,000	↓
Initial	MW		MW				MW	
Date	10/31/18		10/31/18				10/31/18	
Time	1250		1258				1415	
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.5		25.1		27.4		25.1	
Vol of Elutriate (mL)	5,000		5,000		75,000		5,000 mL	
Grams of Salt (g)	31.7g		28.2		224.6g		28.2g	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	28.0		28.2		28.4		28.4	
Date & Initial	10/31/18 MW		10/31/18 MW		10/31/18 LAG		10/31/18	

COPY

PREPARATION of DILUTIONS

STUDY: 31291 CLIENT: AECOM DILUENT: CLDS
 SPECIES: M. beryllina TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 4		Composite #: 4		Composite #: 3		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	2,000	0	2,000	0	2,000		
(RW)	0	↓	0	↓	0	↓		
1 %	20	↓	20	↓	20	↓		
10 %	200	↓	200	↓	200	↓		
50 %	1,000	↓	1,000	↓	1,000	↓		
100 %	2,000	↓	2,000	↓	2,000	↓		
Initial	MW		MW		MW			
Date	10/31/18		10/31/18		10/31/18			
Time	1505		1450		1530			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	25.4		25.1		25.7		25.7 MW 10/31	
Vol of Elutriate (mL)	5,000		5,000		5,000			
Grams of Salt (g)	10.3g		28.2g		24.8g			
Lot number of Salt	A-5117		A-5117		A-5117		A	
Final Salinity	28.1		28.3		28.1			
Date & Initial	10/31/18 MW		10/31/18 MW		10/31/18 MW			

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:** #1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102918 **Sample:** Controls **Diluent:** CLDS

SURVIVAL - Controls

Conc	Rep	HOURS						Conc	Rep	HOURS					
		0	1	24	48	72	96			0	1	24	48	72	96
LAB control water)	A	10	10	10	8	8	8	CLDS (Reference Water)	A	10	10	10	10	10	10
	B	10	10	10	10	10	9		B	10	10	10	9	9	9
	C	10	10	10	10	10	10		C	10	10	9	8	7	7
	D	10	10	10	10	9	9		D	10	10	10	10	10	10
	E	10	10	10	9	9	9		E	10	10	10	10	10	10
Initials		LAG	MS	LAG	CFS	CFS	LAG	Comments: <i>EIO LAG 11/04 Daylight Savings</i>							
Date		10/31/18	10/31/18	11/1/18	11/02	11/03	11/04								
Time		1605	1700 1530	1435	1535	1535	1325								

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
345-346	371-372
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
LAB	A	7.3	6.7	6.7	5.8	6.0	8.00	7.87	7.80	7.60	7.73	19	20	20	20	20	31	32	32	33	32	/	/	/	/	/
(RW)	A	8.7	6.8	6.7	6.3	6.6	7.97	7.85	7.84	7.83	7.82	19	20	20	20	20	29	29	30	31	32	/	/	/	/	/
Initials		MT	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #		MLO2	DO Meter #		MLO1				
Time		1530	0830	0955	1025	0930						0	24	48	72	96	DO Probe #		100	DO Probe #		96				
Incub. Temp		21	21	21	20	21	Water Quality Station #		MLO1	MLO1	MLO1	2	2	pH Meter #		MLO2	pH Meter #		MLO1							
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #		2	MLO1	MLO1	MLO1	MLO1	pH Probe #		103	pH Probe #		158							
Fed By:		MS	LAG	CFS	CFS	/	Initial		MT	CFS	CFS	CFS	MT	Salinity Meter #		MLO2	Salinity Meter #		MLO1							

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID: #** 1
Test Species: *Menidia beryllina* **Lot ID:** 08M6AR0102918 **Sample:** Composite #1 **Diluent:** CLDS

SURVIVAL - Composite #6 | ^{ES} _{10/13/1}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	8	8	8	7
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	9	9	9	9
	E	10	10	9	9	9	9
10 %	A	10	10	9	7	7	7
	B	10	10	9	8	8	8
	C	10	10	9	9	9	9
	D	10	10	10	10	9	9
	E	10	10	10	10	10	10
Initials		LAG	MS	LAG	CFS	CFS	LAG
Date		10/31	10/31/13	11/01/13	11/02	11/03	11/04
Time		1615	1740	1450	1540	1540	1330

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
347-350	373-376
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

ES LAG 11/04 Daylight Savings

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	6.8	6.1	6.4	6.8	7.92	7.88	7.77	7.80	7.80	20	20	20	20	20	29	29	30	30	31					
10 %	A	8.2	7.0	6.6	6.3	6.9	7.96	7.91	7.83	7.81	7.85	20	20	20	20	20	29	29	30	30	31					
50 %	A	7.7	7.0	6.7	6.3	6.9	7.91	7.85	7.86	7.82	7.86	20	20	20	20	20	28	28	29	30	31					
100 %	A	6.6	6.7	6.6	6.5	6.8	7.83	7.85	7.86	7.85	7.86	21	20	20	20	20	28	28	28	29	30					
Initials		MT	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #					DO Meter #				
Time		1350	0840	1000	1030	0940	0 24 48 72 96										DO Probe #					DO Probe #				
Incub. Temp		21	21	21	20	21	Water Quality Station #										pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #										pH Probe #					pH Probe #				
Fed By:		MS	LAG	CFS	CFS		Initial										Salinity Meter #					Salinity Meter #				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID: #** 1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102918 **Sample:** Composite #2 **Diluent:** CLDS

SURVIVAL - Composite # 6.2 ^{10.2}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	9
	E	10	10	10	8	8	8
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	9	9	9	9
	E	10	10	10	10	10	10
Initials		LAG	MS	LAG	CFS	CFS	LAG
Date		10/31	10/31/18	11/01/18	11/02	11/03	11/04
Time		1630	1750	1520	1550	1550	1345

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
351-354	377-380
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

RELO LAG 11/04 Daylight Savings

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	6.4	6.3	6.5	6.7	7.96	7.82	7.75	7.77	7.74	19	20	20	20	20	29	29	30	31	32	/	/	/	/	/
10 %	A	8.2	6.7	6.5	6.6	6.8	7.97	7.89	7.85	7.83	7.84	19	20	20	20	20	29	29	30	31	32	/	/	/	/	/
50 %	A	7.4	6.7	6.7	6.5	7.0	7.91	7.85	7.85	7.84	7.88	19	20	20	20	20	28	29	30	30	32	/	/	/	/	/
100 %	A	5.8	6.6	6.7	6.6	7.0	7.85	7.81	7.83	7.88	7.92	19	20	20	20	20	28	28	29	30	32	/	/	/	/	/
Initials		MT	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #					DO Meter #				
Time		1340	0950	1005	1035	1000	0 24 48 72 96										DO Probe #					DO Probe #				
Incub. Temp		21	20	20	20	21	Water Quality Station #										pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A - 5179)							Thermometer or Probe #										pH Probe #					pH Probe #				
Fed By:		MS	LAG	CFS	CFS		Initial										Salinity Meter #					Salinity Meter #				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID: #:** 1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102918 **Sample:** Composite #3 **Diluent:** CLDS

SURVIVAL - Composite #63 ^{11/10/17}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	9	9	9	9
	B	10	10	9	8	8	8
	C	10	10	10	10	10	10
	D	10	10	10	10	10	9
	E	10	10	9	9	9	9
10 %	A	10	10	9	9	9	9
	B	10	10	10	9	9	9
	C	10	10	9	8	8	8
	D	10	10	9	9	9	9
	E	10	10	9	9	9	9

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	9	8	8	8
	B	10	10	10	10	10	10
	C	10	10	10	10	9	9
	D	10	10	10	10	10	9
	E	10	10	10	10	9	9

Initials	LAG	MS	LAG	CFS	CFS	LAG
Date	10/31	10/31/18	11/01	11/02	11/03	11/04
Time	1645	1800	1645	1600	1555	1355

1600

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
355-358	381-384
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

EO LAG 11/04 Daylight Savings

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	6.5	6.7	6.5	6.7	7.98	7.80	7.82	7.83	7.78	20	20	20	20	20	29	29	29	30	31	/	/	/	/	/
10 %	A	8.3	6.3	6.7	6.5	6.8	7.97	7.78	7.83	7.84	7.84	20	20	20	20	20	29	29	30	30	31	/	/	/	/	/
50 %	A	7.6	6.4	6.7	6.5	6.6	7.90	7.77	7.82	7.83	7.83	20	20	20	20	20	29	28	29	30	31	/	/	/	/	/
100 %	A	5.6	6.6	6.5	6.4	6.6	7.79	7.83	7.82	7.84	7.84	21	20	20	20	20	28	28	29	29	30	/	/	/	/	/

Initials		RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2								
Date	10/31	Exposure (Hours)					DO Meter #					DO Meter #								
Time	1545	0855	1015	1040	0950	0	24	48	72	96	DO Probe #					DO Probe #				
Incub. Temp	21	20	21	20	21	Water Quality Station #					pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)		Thermometer or Probe #					pH Probe #					pH Probe #								
Fed By:	MS	LAG	CFS	CFS	/	Initial					Salinity Meter #					Salinity Meter #				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID: #** 1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102918 **Sample:** Composite #4 **Diluent:** CLDS

SURVIVAL - Composite #64 ^{10/31}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	9	7	7	7
	B	10	10	9	9	9	9
	C	10	10	10	10	10	9
	D	10	10	10	10	9	9
	E	10	10	10	8	8	8
10 %	A	10	10	9	9	9	9
	B	10	10	9	9	9	9
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		LAG	MS	LAG	CFS	CFS	LAG
Date		10/31	10/31/18	11/01/18	11/02	11/03	11/04
Time		1705	1810	1545	1610	1605	1410

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	9	8	8	8
	B	10	10	10	9	9	9
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	9	9	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	9	9	9	9
	E	10	10	10	10	10	10

Comments:
 10/31/18
 EIO Savings
 LAG
 11/04

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
359-362	385-388
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.2	7.0	6.7	6.4	6.5	7.95	7.89	7.86	7.80	7.73	19	20	20	20	20	30	29	30	30	31	/	/	/	/	/
10 %	A	8.3	6.7	6.6	6.4	6.6	7.97	7.87	7.85	7.82	7.83	20	20	20	20	20	29	29	30	30	31	/	/	/	/	/
50 %	A	7.6	6.7	6.4	6.4	6.7	7.97	7.86	7.84	7.86	7.87	19	20	20	20	20	29	29	29	30	31	/	/	/	/	/
100 %	A	5.7	6.6	6.4	6.6	6.7	7.95	7.88	7.85	7.90	7.89	19	20	20	20	20	28	28	29	29	30	/	/	/	/	/
Initials		LAG	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #					DO Meter #				
Time		1515	0900	1020	1045	1015											DO Probe #					DO Probe #				
Incub. Temp		21	20	20	20	21											pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)																	pH Probe #					pH Probe #				
Fed By:		MS	LAG	CFS	CFS												Salinity Meter #					Salinity Meter #				

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID:** #1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0107918 **Sample:** Composite #5 **Diluent:** CLDS

SURVIVAL - Composite # 65 ^{CS or 10/13/1}

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	9	9	9
	B	10	10	9	9	9	7
	C	10	10	9	9	8	8
	D	10	10	10	10	10	10
	E	10	10	10	9	9	9
10 %	A	10	10	10	10	10	10
	B	10	10	10	9	9	9
	C	10	10	9	9	9	9
	D	10	10	10	10	10	10
	E	10	10	9 ^{CS or 10/13/1}	9	9	9
Initials		LAG	MS	MS	CFS	CFS	LAG
Date		10/31	10/31/18	11/01/18	11/02	11/03	11/04
Time		1730	1830	1600	1620	1610	1435

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	9	9	9
	D	10	10	10	9	9	9
	E	10	10	10	10	10	10

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
363-366	389-392
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

Comments:
 (E) LAG 11/04 Daylight savings.

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)																								
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96																				
1 %	A	8.2	6.7	6.6	6.2	6.2	7.97	7.83	7.83	7.78	7.74	20	20	20	20	20	30	29	30	30	31	/	/	/	/	/																				
10 %	A	8.2	6.2	6.3	5.8	6.2	7.96	7.79	7.75	7.74	7.76	19	20	20	20	20	29	29	30	30	31	/	/	/	/	/																				
50 %	A	7.5	6.5	6.4	6.1	6.7	7.92	7.86	7.85	7.83	7.88	19	20	20	20	20	29	28	29	30	31	/	/	/	/	/																				
100 %	A	6.0	6.4	6.5	6.2	6.5	7.80	7.87	7.88	7.89	7.88	19	20	20	20	20	28	28	28	29	30	/	/	/	/	/																				
Initials		LAG	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2																								
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #		MLO2			DO Meter #		MLO1																						
Time		1510	0920	1025	1050	1125	0					24					48					72					96					DO Probe #		1G0			DO Probe #		9G							
Incub. Temp		21	20	20	20	21	Water Quality Station #					1					2					2					2					2					pH Meter #		MLO7			pH Meter #		MLO1		
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #					MLO7					MLO1					MLO1					MLO1					MLO1					pH Probe #		1G3			pH Probe #		158		
Fed By:		MS	LAG	CFS	CFS	/	Initial					LAG					CFS					CFS					CFS					MT					Salinity Meter #		MLO2			Salinity Meter #		MLO1		

12/13 MT (E) Time for water qualities overlooked

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31291 **Project:** New Haven **Client:** AECOM **Incubator ID: #** 1
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102918 **Sample:** Composite #6 **Diluent:** CLDS

SURVIVAL - Composite # 6

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	9
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
10 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	10
	E	10	10	10	10	10	10
Initials		LAG	MS	LAG	CFS	CFS	MT
Date		10/31	10/31/17	11/01/18	11/02	11/03	11/04
Time		1450	1530	1610	1630	1615	1410

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	10	10	10	10
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	9
	E	10	10	10	10	10	10
100 %	A	10	10	10	10	9	9
	B	10	10	10	10	10	10
	C	10	10	10	10	10	10
	D	10	10	10	10	10	9
	E	10	10	10	10	10	10

Ammonia pulled on 100% and Controls	
** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **	
Start	End
367-370	393-396
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

Comments:

(23) MT 11/04 Daylight Savings

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
1 %	A	8.4	6.7	6.4	6.6	6.9	7.94	7.87	7.76	7.82	7.82	20	20	20	20	20	29	29	29	30	31					
10 %	A	8.3	6.6	6.4	6.2	6.5	7.97	7.85	7.79	7.78	7.80	20	20	20	20	20	29	29	29	30	31					
50 %	A	7.6	6.3	6.1	6.0	6.2	7.97	7.84	7.78	7.80	7.81	21	20	20	20	20	29	28	29	29	30					
100 %	A	5.8	6.4	6.4	6.0	6.0	7.97	7.89	7.87	7.81	7.81	22	20	20	20	20	28	28	28	29	29					
Initials		LAG	CFS	CFS	CFS	MT	RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2				
Date		10/31	11/01	11/02	11/03	11/04	Exposure (Hours)										DO Meter #					DO Meter #				
Time		1530	0925	1030	1055	1025	0 24 48 72 96										DO Probe #					DO Probe #				
Incub. Temp		21	20	20	20	21	Water Quality Station #										pH Meter #					pH Meter #				
FEEDING: <i>Artemia nauplii</i> (A-5179)							Thermometer or Probe #										pH Probe #					pH Probe #				
Fed By:		MS	LAG	CFS	CFS		Initial										Salinity Meter #					Salinity Meter #				

Assay Review Checklist

DATE IN: 10/31/18
 DATE DUE: _____

STUDY#: 31291
 CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: SPPMB96AD

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/31/18	MS	
Day 1	11/01/18	LAG	
Day 2	11/02/18	CFS	
Day 3	11/03/18	CFS	
Day 4	11/14/18	MT	
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/6/18	MR	
Statistical Analysis Reviewed	11/7/18	LE (MR)	
Data Acceptability Review	11/7/18	MR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LABFORMS\ Assay Review Checklist.wpd

Menidia beryllina
Suspended Particulate Phase
Statistical Analysis Reports
Survival
Mitigated Assays

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:05 (p 1 of 1)
Test Code/ID: 20-0044-5747/31291Mb-Comp1

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-112						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V',W')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	4	10				8			
0	LS	2	9	10				9			
0	LS	3	13	10				10			
0	LS	4	20	10				9			
0	LS	5	25	10				9			
0	R	1	5	10				10			
0	R	2	7	10				9			
0	R	3	15	10				7			
0	R	4	22	10				10			
0	R	5	28	10				10			
1		1	3	10				7			
1		2	12	10				10			
1		3	17	10				10			
1		4	19	10				9			
1		5	27	10				9			
10		1	1	10				7			
10		2	8	10				8			
10		3	18	10				9			
10		4	23	10				9			
10		5	30	10				10			
50		1	6	10				8			
50		2	11	10				7			
50		3	14	10				10			
50		4	21	10				8			
50		5	29	10				8			
100		1	2	10				9			
100		2	10	10				10			
100		3	16	10				9			
100		4	24	10				9			
100		5	26	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:21 (p 1 of 1)
Test Code: 31291Mb-Comp1 | 20-0044-5747

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 12-3991-1381	Code: 31246-112	Client: AECOM
Sample Date: 31 Oct-18 10:40	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 10:40	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 1 Elutriate (V,W')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
09-7382-5907	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.900	0.748	1.000	0.700	1.000	0.055	0.122	13.61%	0.00%
10		5	0.860	0.718	1.000	0.700	1.000	0.051	0.114	13.26%	4.44%
50		5	0.820	0.684	0.956	0.700	1.000	0.049	0.110	13.36%	8.89%
100		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	-4.44%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	1.000	0.900	0.900
0	R	1.000	0.900	0.700	1.000	1.000
1		0.700	1.000	1.000	0.900	0.900
10		0.700	0.800	0.900	0.900	1.000
50		0.800	0.700	1.000	0.800	0.800
100		0.900	1.000	0.900	0.900	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:21 (p 1 of 1)
Test Code: 31291Mb-Comp1 | 20-0044-5747

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 09-7382-5907		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:21		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 12-3991-1381		Code: 31246-112			Client: AECOM							
Sample Date: 31 Oct-18 10:40		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 10:40		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1735774	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.13	2.82	0.6492	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.920	0.700	1.000	0.130	14.20%	0.0%	46/50	0.92	0.0%	
1		5	0.900	0.700	1.000	0.122	13.60%	2.17%	45/50	0.9	2.17%	
10		5	0.860	0.700	1.000	0.114	13.30%	6.52%	43/50	0.873	5.07%	
50		5	0.820	0.700	1.000	0.110	13.40%	10.9%	41/50	0.873	5.07%	
100		5	0.940	0.900	1.000	0.055	5.83%	-2.17%	47/50	0.873	5.07%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	0.700	1.000	1.000						
1		0.700	1.000	1.000	0.900	0.900						
10		0.700	0.800	0.900	0.900	1.000						
50		0.800	0.700	1.000	0.800	0.800						
100		0.900	1.000	0.900	0.900	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:07 (p 1 of 1)
Test Code/ID: 15-9533-5301/31291Mb-Comp2

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-113						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	3	10				8			
0	LS	2	8	10				9			
0	LS	3	17	10				10			
0	LS	4	21	10				9			
0	LS	5	25	10				9			
0	R	1	1	10				10			
0	R	2	10	10				9			
0	R	3	18	10				7			
0	R	4	20	10				10			
0	R	5	30	10				10			
1		1	6	10				9			
1		2	11	10				10			
1		3	15	10				10			
1		4	23	10				9			
1		5	28	10				8			
10		1	2	10				10			
10		2	9	10				10			
10		3	13	10				10			
10		4	19	10				9			
10		5	29	10				10			
50		1	4	10				10			
50		2	7	10				10			
50		3	14	10				10			
50		4	22	10				10			
50		5	27	10				10			
100		1	5	10				10			
100		2	12	10				9			
100		3	16	10				9			
100		4	24	10				10			
100		5	26	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:23 (p 1 of 1)
Test Code: 31291Mb-Comp2 | 15-9533-5301

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 21-3473-6624	Code: 31246-113	Client: AECOM
Sample Date: 31 Oct-18 10:40	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 10:40	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
10-2248-8258	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
21-2906-8636	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.920	0.816	1.000	0.800	1.000	0.037	0.084	9.09%	-2.22%
10		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
100		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	-6.67%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	1.000	0.900	0.900
0	R	1.000	0.900	0.700	1.000	1.000
1		0.900	1.000	1.000	0.900	0.800
10		1.000	1.000	1.000	0.900	1.000
50		1.000	1.000	1.000	1.000	1.000
100		1.000	0.900	0.900	1.000	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:23 (p 1 of 1)
Test Code: 31291Mb-Comp2 | 15-9533-5301

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 10-2248-8258		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:22		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 21-3473-6624		Code: 31246-113			Client: AECOM							
Sample Date: 31 Oct-18 10:40		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 10:40		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1028462	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	4	0.975	0.900	1.000	0.050	5.13%	0.0%	39/40	0.975	0.0%	
1		5	0.920	0.800	1.000	0.084	9.09%	5.64%	46/50	0.967	0.86%	
10		5	0.980	0.900	1.000	0.045	4.56%	-0.51%	49/50	0.967	0.86%	
50		5	1.000	1.000	1.000	0.000	0.00%	-2.56%	50/50	0.967	0.86%	
100		5	0.960	0.900	1.000	0.055	5.71%	1.54%	48/50	0.96	1.54%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	Outlier	1.000	1.000						
1		0.900	1.000	1.000	0.900	0.800						
10		1.000	1.000	1.000	0.900	1.000						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	0.900	0.900	1.000	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:08 (p 1 of 1)
Test Code/ID: 19-3561-4733/31291Mb-Comp3

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-114						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 12:50	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				8			
0	LS	2	10	10				9			
0	LS	3	18	10				10			
0	LS	4	24	10				9			
0	LS	5	26	10				9			
0	R	1	3	10				10			
0	R	2	11	10				9			
0	R	3	17	10				7			
0	R	4	22	10				10			
0	R	5	28	10				10			
1		1	2	10				9			
1		2	9	10				8			
1		3	16	10				10			
1		4	20	10				9			
1		5	25	10				9			
10		1	4	10				9			
10		2	7	10				9			
10		3	14	10				8			
10		4	19	10				9			
10		5	30	10				9			
50		1	6	10				10			
50		2	12	10				10			
50		3	15	10				10			
50		4	21	10				10			
50		5	27	10				10			
100		1	5	10				8			
100		2	8	10				10			
100		3	13	10				9			
100		4	23	10				9			
100		5	29	10				9			

CETIS Summary Report

Report Date: 07 Nov-18 10:24 (p 1 of 1)
Test Code: 31291Mb-Comp3 | 19-3561-4733

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 08-9579-5849	Code: 31246-114	Client: AECOM
Sample Date: 31 Oct-18 12:50	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 12:50	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 3 Elutriate (US-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
08-0796-8015	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
09-7705-7231	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
10		5	0.880	0.824	0.936	0.800	0.900	0.020	0.045	5.08%	2.22%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
100		5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	1.000	0.900	0.900
0	R	1.000	0.900	0.700	1.000	1.000
1		0.900	0.800	1.000	0.900	0.900
10		0.900	0.900	0.800	0.900	0.900
50		1.000	1.000	1.000	1.000	1.000
100		0.800	1.000	0.900	0.900	0.900

CETIS Analytical Report

Report Date: 07 Nov-18 10:24 (p 1 of 2)
Test Code: 31291Mb-Comp3 | 19-3561-4733

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 08-0796-8015		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:23		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 08-9579-5849		Code: 31246-114			Client: AECOM							
Sample Date: 31 Oct-18 12:50		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 12:50		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	581327	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	3.01	2.82	0.0198	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.920	0.700	1.000	0.130	14.20%	0.0%	46/50	0.925	0.0%	
1		5	0.900	0.800	1.000	0.071	7.86%	2.17%	45/50	0.925	0.0%	
10		5	0.880	0.800	0.900	0.045	5.08%	4.35%	44/50	0.925	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	-8.7%	50/50	0.925	0.0%	
100		5	0.900	0.800	1.000	0.071	7.86%	2.17%	45/50	0.9	2.7%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	0.700	1.000	1.000						
1		0.900	0.800	1.000	0.900	0.900						
10		0.900	0.900	0.800	0.900	0.900						
50		1.000	1.000	1.000	1.000	1.000						
100		0.800	1.000	0.900	0.900	0.900						

CETIS Analytical Report

Report Date: 07 Nov-18 10:24 (p 2 of 2)
Test Code: 31291Mb-Comp3 | 19-3561-4733

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.	
Analysis ID: 09-7705-7231		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:23		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 08-9579-5849		Code: 31246-114			Client: AECOM						
Sample Date: 31 Oct-18 12:50		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 31 Oct-18 12:50		Source: New Haven Harbor 2018									
Sample Age: 3h		Station: Comp 3 Elutriate (US-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1041688	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	4	0.975	0.900	1.000	0.050	5.13%	0.0%	39/40	0.975	0.0%
1		5	0.900	0.800	1.000	0.071	7.86%	7.69%	45/50	0.927	4.96%
10		5	0.880	0.800	0.900	0.045	5.08%	9.74%	44/50	0.927	4.96%
50		5	1.000	1.000	1.000	0.000	0.00%	-2.56%	50/50	0.927	4.96%
100		5	0.900	0.800	1.000	0.071	7.86%	7.69%	45/50	0.9	7.69%
96h Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	1.000	0.900	Outlier	1.000	1.000					
1		0.900	0.800	1.000	0.900	0.900					
10		0.900	0.900	0.800	0.900	0.900					
50		1.000	1.000	1.000	1.000	1.000					
100		0.800	1.000	0.900	0.900	0.900					

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:09 (p 1 of 1)
Test Code/ID: 10-0880-3069/31291Mb-Comp4

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-115						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 12:50	Material:	Elutriate Solution	Sample Station:	Comp 4 Elutriate (DS-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	4	10				8			
0	LS	2	9	10				9			
0	LS	3	15	10				10			
0	LS	4	24	10				9			
0	LS	5	25	10				9			
0	R	1	6	10				10			
0	R	2	11	10				9			
0	R	3	17	10				7			
0	R	4	22	10				10			
0	R	5	28	10				10			
1		1	1	10				7			
1		2	7	10				9			
1		3	14	10				9			
1		4	19	10				9			
1		5	30	10				8			
10		1	2	10				9			
10		2	8	10				9			
10		3	18	10				10			
10		4	21	10				10			
10		5	26	10				10			
50		1	3	10				8			
50		2	10	10				9			
50		3	16	10				10			
50		4	23	10				10			
50		5	27	10				10			
100		1	5	10				9			
100		2	12	10				10			
100		3	13	10				10			
100		4	20	10				9			
100		5	29	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:25 (p 1 of 1)
Test Code: 31291Mb-Comp4 | 10-0880-3069

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 13-1258-1800	Code: 31246-115	Client: AECOM
Sample Date: 31 Oct-18 12:50	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 12:50	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
14-4434-1967	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.840	0.729	0.951	0.700	0.900	0.040	0.089	10.65%	6.67%
10		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	-6.67%
50		5	0.940	0.829	1.000	0.800	1.000	0.040	0.089	9.52%	-4.44%
100		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	-6.67%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	1.000	0.900	0.900
0	R	1.000	0.900	0.700	1.000	1.000
1		0.700	0.900	0.900	0.900	0.800
10		0.900	0.900	1.000	1.000	1.000
50		0.800	0.900	1.000	1.000	1.000
100		0.900	1.000	1.000	0.900	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:24 (p 1 of 1)
Test Code: 31291Mb-Comp4 | 10-0880-3069

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 14-4434-1967		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:24		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 13-1258-1800		Code: 31246-115			Client: AECOM							
Sample Date: 31 Oct-18 12:50		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 12:50		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	84170	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.59	2.82	0.1319	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.920	0.700	1.000	0.130	14.20%	0.0%	46/50	0.924	0.0%	
1		5	0.840	0.700	0.900	0.089	10.60%	8.7%	42/50	0.924	0.0%	
10		5	0.960	0.900	1.000	0.055	5.71%	-4.35%	48/50	0.924	0.0%	
50		5	0.940	0.800	1.000	0.089	9.52%	-2.17%	47/50	0.924	0.0%	
100		5	0.960	0.900	1.000	0.055	5.71%	-4.35%	48/50	0.924	0.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	0.700	1.000	1.000						
1		0.700	0.900	0.900	0.900	0.800						
10		0.900	0.900	1.000	1.000	1.000						
50		0.800	0.900	1.000	1.000	1.000						
100		0.900	1.000	1.000	0.900	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:09 (p 1 of 1)
Test Code/ID: 06-1551-0814/31291Mb-Comp5

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-116						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 11:25	Material:	Elutriate Solution	Sample Station:	Comp 5 Elutriate (TB-1,-2)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				8			
0	LS	2	7	10				9			
0	LS	3	16	10				10			
0	LS	4	19	10				9			
0	LS	5	30	10				9			
0	R	1	6	10				10			
0	R	2	10	10				9			
0	R	3	18	10				7			
0	R	4	22	10				10			
0	R	5	28	10				10			
1		1	3	10				9			
1		2	9	10				7			
1		3	15	10				8			
1		4	24	10				10			
1		5	25	10				9			
10		1	4	10				10			
10		2	8	10				9			
10		3	17	10				9			
10		4	21	10				10			
10		5	29	10				9			
50		1	2	10				10			
50		2	11	10				10			
50		3	13	10				10			
50		4	23	10				10			
50		5	27	10				10			
100		1	5	10				10			
100		2	12	10				10			
100		3	14	10				9			
100		4	20	10				9			
100		5	26	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:25 (p 1 of 1)
Test Code: 31291Mb-Comp5 | 06-1551-0814

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 09-1743-2857	Code: 31246-116	Client: AECOM
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 11:25	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
21-2289-7376	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	

96h Proportion Survived Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.860	0.718	1.000	0.700	1.000	0.051	0.114	13.26%	4.44%
10		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	-4.44%
50		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
100		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	-6.67%

96h Proportion Survived Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LS	0.800	0.900	1.000	0.900	0.900
0	R	1.000	0.900	0.700	1.000	1.000
1		0.900	0.700	0.800	1.000	0.900
10		1.000	0.900	0.900	1.000	0.900
50		1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	0.900	0.900	1.000

CETIS Analytical Report

Report Date: 07 Nov-18 10:25 (p 1 of 1)
Test Code: 31291Mb-Comp5 | 06-1551-0814

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 21-2289-7376		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:25		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 09-1743-2857		Code: 31246-116			Client: AECOM							
Sample Date: 31 Oct-18 11:25		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 11:25		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 5 Elutriate (TB-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1724555	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.71	2.82	0.0805	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.920	0.700	1.000	0.130	14.20%	0.0%	46/50	0.936	0.0%	
1		5	0.860	0.700	1.000	0.114	13.30%	6.52%	43/50	0.936	0.0%	
10		5	0.940	0.900	1.000	0.055	5.83%	-2.17%	47/50	0.936	0.0%	
50		5	1.000	1.000	1.000	0.000	0.00%	-8.7%	50/50	0.936	0.0%	
100		5	0.960	0.900	1.000	0.055	5.71%	-4.35%	48/50	0.936	0.0%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	0.700	1.000	1.000						
1		0.900	0.700	0.800	1.000	0.900						
10		1.000	0.900	0.900	1.000	0.900						
50		1.000	1.000	1.000	1.000	1.000						
100		1.000	1.000	0.900	0.900	1.000						

CETIS Test Data Worksheet

Report Date: 06 Nov-18 16:10 (p 1 of 1)
Test Code/ID: 14-8920-5518/31291Mb-Comp6

Menidia beryllina 96-h Acute Survival Test						EnviroSystems, Inc.					
Start Date:	31 Oct-18 16:05	Species:	Menidia beryllina	Sample Code:	31246-117						
End Date:	04 Nov-18 13:25	Protocol:	EPA/821/R-02-012 (2002)	Sample Source:	New Haven Harbor 2018						
Sample Date:	31 Oct-18 11:25	Material:	Elutriate Solution	Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)						

Conc-%	Code	Rep	Pos	# Exposed	24h Survival	48h Survival	72h Survival	96h Survival	01hSurvival	02hSurvival	Notes
0	LS	1	1	10				8			
0	LS	2	10	10				9			
0	LS	3	15	10				10			
0	LS	4	21	10				9			
0	LS	5	30	10				9			
0	R	1	5	10				10			
0	R	2	9	10				9			
0	R	3	16	10				7			
0	R	4	20	10				10			
0	R	5	28	10				10			
1		1	4	10				10			
1		2	8	10				9			
1		3	14	10				10			
1		4	22	10				10			
1		5	26	10				10			
10		1	3	10				10			
10		2	11	10				10			
10		3	17	10				10			
10		4	24	10				10			
10		5	29	10				10			
50		1	6	10				10			
50		2	7	10				10			
50		3	13	10				10			
50		4	19	10				9			
50		5	27	10				10			
100		1	2	10				9			
100		2	12	10				10			
100		3	18	10				10			
100		4	23	10				9			
100		5	25	10				10			

CETIS Summary Report

Report Date: 07 Nov-18 10:26 (p 1 of 1)
Test Code: 31291Mb-Comp6 | 14-8920-5518

Menidia beryllina 96-h Acute Survival Test **EnviroSystems, Inc.**

Batch ID: 16-5096-4794	Test Type: Survival (96h)	Analyst: Nancy Roka
Start Date: 31 Oct-18 16:05	Protocol: EPA/821/R-02-012 (2002)	Diluent: CLDS Reference Site
Ending Date: 04 Nov-18 13:25	Species: Menidia beryllina	Brine: Not Applicable
Duration: 93h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 07-9158-2244	Code: 31246-117	Client: AECOM
Sample Date: 31 Oct-18 11:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 31 Oct-18 11:25	Source: New Haven Harbor 2018	
Sample Age: 5h	Station: Comp 6 Elutriate (CAD-1,-2,-3)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
03-3326-3014	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
21-3497-6686	96h Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

96h Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.900	0.812	0.988	0.800	1.000	0.032	0.071	7.86%	0.00%
0	R	5	0.920	0.758	1.000	0.700	1.000	0.058	0.130	14.17%	-2.22%
1		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
10		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-11.11%
50		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	-8.89%
100		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	-6.67%

96h Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.800	0.900	1.000	0.900	0.900	
0	R	1.000	0.900	0.700	1.000	1.000	
1		1.000	0.900	1.000	1.000	1.000	
10		1.000	1.000	1.000	1.000	1.000	
50		1.000	1.000	1.000	0.900	1.000	
100		0.900	1.000	1.000	0.900	1.000	

CETIS Analytical Report

Report Date: 07 Nov-18 10:26 (p 1 of 1)
Test Code: 31291Mb-Comp6 | 14-8920-5518

Menidia beryllina 96-h Acute Survival Test										EnviroSystems, Inc.		
Analysis ID: 21-3497-6686		Endpoint: 96h Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:26		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 07-9158-2244		Code: 31246-117			Client: AECOM							
Sample Date: 31 Oct-18 11:25		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 31 Oct-18 11:25		Source: New Haven Harbor 2018										
Sample Age: 5h		Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	686165	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
96h Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	4	0.975	0.900	1.000	0.050	5.13%	0.0%	39/40	0.985	0.0%	
1		5	0.980	0.900	1.000	0.045	4.56%	-0.51%	49/50	0.985	0.0%	
10		5	1.000	1.000	1.000	0.000	0.00%	-2.56%	50/50	0.985	0.0%	
50		5	0.980	0.900	1.000	0.045	4.56%	-0.51%	49/50	0.98	0.51%	
100		5	0.960	0.900	1.000	0.055	5.71%	1.54%	48/50	0.96	2.54%	
96h Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	1.000	0.900	Outlier	1.000	1.000						
1		1.000	0.900	1.000	1.000	1.000						
10		1.000	1.000	1.000	1.000	1.000						
50		1.000	1.000	1.000	0.900	1.000						
100		0.900	1.000	1.000	0.900	1.000						

Arbacia punctulata
Suspended Particulate Phase

Bench Sheets

Unmitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31248	Incubator ID:	142 0
Project:	New Haven	Client:	AECOM

Composites 1, 2 & 6

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input checked="" type="checkbox"/> Sea Urchin (<i>Arbacia</i>)
Water Quality Parameters	
Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt pH: 7.8 ± 0.5	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C Photoperiod: 16 hour light, 8 hour dark
Test Chamber	Solution Volume
(Check box for all that apply) <input checked="" type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input type="checkbox"/> other _____	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____
Replicate Information	
<i>A. bahia</i> and <i>M. beryllina</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 10 organisms per chamber 	<i>Arbacia</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 20-30 embryos/mL
Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)
Feeding	
<i>A. bahia</i>: Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i>: Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i>: NONE	
Date: 10/25/18	Initial GRS



99AP AR0080118

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Artemia punctulata

Source: Lab reared _____ Hatchery reared _____ Field collected

Hatch date mixed ages Receipt date 08/01/18

Lot number 080118AP Strain WILD

Brood origination NC

II. Water Quality

Temperature 16 °C Salinity 30 ppt D.O. SAT ppm

pH 8.2 su Hardness - ppm Alkalinity - ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating _____ Flow through Static renewal _____

DIET: Flake food _____ Phytoplankton _____ Trout chow _____

Artemia _____ Rotifers _____ YCT _____ Other MARU ALGAE

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: ESTI # of Organisms 50

Carrier: FED EX / PICKUP Date shipped 08/01/18

Biologist: Steve Smith

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31248 CLIENT: AECOM DILUENT: CLDS
 SPECIES: A. punctulata TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: 6		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1,000	0	1,000	0	1,000		
(RW)	0	↓	0	↓	0	↓		
1 %	10		10		10			
10 %	100		100		100			
50 %	500		500		500			
100 %	1000		1,000		1,000			
Initial	LAG		CFS		CFS			
Date	10/25/18		10/25/18		10/25/18			
Time	1522		1605		1650			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.9		24.8		24.2			
Vol of Elutriate (mL)	8,000		8,000		5,500			
Grams of Salt (g)	47.0		47.9		36.7			
Lot number of Salt	A- 5117		A- 5117		A- 5117		A-	
Final Salinity	28.1		27.9		29.9			
Date & Initial	10/25/18 MW		10/25/18 MW		10/25/18 LAG			

EMBRYO WORKSHEET

DATE: '10/25/18

ESI STUDY: 31248

CLIENT: AECOM

PROJECT: New Haven

Eggs Collected @: 153020 ^{EGS 10/25} Pre-assay fertilization check: 96% ANALYST: GRS

Sperm Collected @: 152030 ^{SPS 10/25} *A mated subsample of egg+sperm must achieve ≥90% fertilization in order to be used in testing.*

Egg Stock Suspension Count:

Take 1mL of egg stock suspension and using a glass graduated cylinder dilute with seawater to a final volume of 100 mL. Count a subsample of the diluted suspension to get an estimate of the egg concentration. The diluted suspension should have 40 - 50 eggs/mL, (which would represent an egg concentration of 4,000 - 5,000 in the stock suspension.)

Egg Count (per mL) of diluted suspension: 47

Sperm Stock Suspension Count:

Once added to the egg stock, the final sperm concentration should be $1 \times 10^5 - 1 \times 10^7$ in solution E.

1. Hemocytometer Count (E):	<u>110</u>		
2. Hemocytometer Count (E):	<u>106</u>		
Average Count (E):	<u>108</u>	X10 ⁴	= sperm solution E = <u>1.08×10^6</u>
Sperm Concentrations:	Solution E X 40	=	Solution B = <u>4.32×10^7</u>
	Solution E X 20	=	Solution C = <u>2.16×10^7</u>
	Solution E X 5	=	Solution D = <u>5.40×10^6</u>

Sperm Count (per mL): 1.08×10^6

mL of Eggs to Add: 175

mL of Sperm to Add: 25

Gametes mixed @: 1555

Gametes must be mixed within 1 hour of collection.

Calculated Embryo Stock Concentration (per mL): 0.875

The test concentration should be 20 - 30 embryos per mL.

Calculated Embryo Stock (mL) needed per chamber: 1.36

Add calculated amount of embryo stock to a surrogate chamber, gently mix, then count a 5mL aliquot.

Embryo Concentration Check: 113

If the check concentration is acceptable, then proceed with embryo addition to the test.

Volume Embryo Stock (mL) added to test solutions: 0.680

Embryos Added to Test Solutions @: 1735

INITIAL COUNTS:	Embryos/ 5 mL
SURROGATE A	<u>113</u>
SURROGATE B	<u>130</u>
SURROGATE C	<u>119</u>
Mean:	<u>121</u>

Organism Lot ID: 99APAR0080118

Mean per mL: 24

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31248	Client:	AECOM
Project:	New Haven		
Test Species:	A. punctulata	Lot ID:	99A PAR008018
Diluent:	CLDS		

DAILY WATER QUALITIES

DAILY WATER QUALITIES										Ammonia pulled on 100% and Controls	
Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		START	END
		0 hr	END 96 hr	0 hr	END 96 hr	0 hr	END 96 hr	0 hr	END 96 hr		
Controls	Lab	8.5	7.4	7.98	8.02	20	21	31	32	200	246
	CLDS	8.5	7.6	7.91	8.06	19	21	29	31	213	247
Composite #1	1 %	8.4	7.4	7.91	8.04	19	21	29	29		
	10 %	8.3	7.4	7.85	8.18	20	21	29	29		
	50 %	7.8	7.2	7.75	8.35	20	21	29	29		
	100 %	6.6	7.2	7.68	8.43	21	21	29	29	201-204	248-251
Composite #2	1 %	7.3	7.5	7.87	8.02	20	21	29	29		
	10 %	7.8	7.5	7.85	8.18	20	21	29	29		
	50 %	7.8	7.3	7.78	8.35	20	21	29	29		
	100 %	7.3	7.3	7.73	8.42	20	21	29	29	205-208	252-255
Initials		MT	GRS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/25/18	10/29/18	Exposure				DO Meter #	MLO2	DO Meter #	
Time		1540	1245			0	24	DO Probe #	160	DO Probe #	
Incub. Temp		21	21	Water Quality Station #	1	1		pH Meter #	MLO2	pH Meter #	
Comments:				Thermometer or Probe #	MLO2	MLO2		pH Probe #	163	pH Probe #	
				Initial	MT	GRS	Salinity Meter	MLO2	Salinity Meter		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31248	Client:	AECOM
Project:	New Haven	Diluent:	CLDS
Test Species:	<i>A. punctulata</i>	Lot ID:	99AFAR0080118

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 96 hr	0 hr	END 96 hr	0 hr	END 96 hr	0 hr	END 96 hr	START	END
Composite #6	1 %	8.1	7.5	7.86	8.08	21	21	29	29		
	10 %	8.2	7.5	7.90	8.12	21	21	29	29		
	50 %	8.0	7.2	7.95	8.26	21	21	30	30		
	100 %	7.6	7.2	7.97	8.35	20	21	31	31	209-212	256 - 259
/		/		/		/		/			
Initials		MT	GRS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/25/18	10/29/18	Exposure				DO Meter #	MLOZ	DO Meter #	
Time		1705	1245		0	24	DO Probe #	160	DO Probe #		
Incub. Temp		21	21	Water Quality Station #	1	1	pH Meter #	MLOZ	pH Meter #		
Comments:				Thermometer or Probe #	MLOZ	MLOZ	pH Probe #	163	pH Probe #		
				Initial	MT	GRS	Salinity Meter	MLOZ	Salinity Meter		

Arbacia Punctulata Survival / Development Assay

ESI Study: 31248
 Client: AECOM
 Count Date: 10/30/18

Assay Start: 10/25/18 1735
 Assay End: 10/29/18 1140
 Initials: GRS

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Lab Control Water	99/99	^{89/89} 90/89	91/89	98/96	93/90
CLDS Reference Water	112/107	90/88	95/90	90/86	85/89
Composite 1 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	106/102	89/89	118/117	90/89	118/118
10%	41/21	70/15	43/22	27/5	33/14
50%	0/0	0/0	0/0	0/0	0/0
100%	0/0	0/0	0/0	0/0	0/0
Composite 2 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	119/117	97/95	122/121	101/100	122/122
10%	62/11	94/7	72/11	71/9	80/9
50%	0/0	0/0	0/0	0/0	0/0
100%	0/0	0/0	0/0	0/0	0/0

Composite 3 ^(31248/3125) Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	113/113	112/112	121/120	95/95	119/119
10%	101/101	118/116	109/107	114/113	107/107
50%	0/0	0/0	0/0	0/0	0/0
100%	0/0	0/0	0/0	0/0	0/0

Composite 4 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					

GRS/10/25

Assay Review Checklist

DATE IN: 10/25/18
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: AP96514

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/25/18	GRS	Start
Day 1	10/26/18		Observation
Day 2	10/28/18		↓
Day 3	10/28/18		↓
Day 4	10/29/18		END
Day 5	10/30/18		Counts
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	11/16/18	JTP	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)	10/30/18	GRS	
Bench Sheets Complete (dates, times, initials, etc...)	↓	↓	
Water Quality Data Complete	↓	↓	
TRC Values & Bottle Numbers	↓	↓	
Daphnid Calculations Complete	N/A	N/A	
Weights Reported	↓	↓	
Assay Acceptability Review	10/30/18	GRS	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/6/18	MR	
Statistical Analysis Reviewed	11/6/18	JF	
Data Acceptability Review	11/6/18	MR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31248	Incubator ID:	142
Project:	New Haven	Client:	AECOM

Composites 3, 4 & 5

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input checked="" type="checkbox"/> Sea Urchin (<i>Arbacia</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt (E3) MR 11/2/18	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C 20 ± 1 °C (E3) MR 11/2/18
pH: 7.8 ± 0.5	Photoperiod: 16 hour light, 8 hour dark

Test Chamber	Solution Volume
(Check box for all that apply) <input checked="" type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input type="checkbox"/> other _____	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____

Replicate Information

<i>A. bahia</i> and <i>M. beryllina</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 10 organisms per chamber 	<i>Arbacia</i>: <ul style="list-style-type: none"> • 5 Reps per treatment • 20-30 embryos/mL
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Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)

Feeding

<i>A. bahia</i>: Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i>: Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i>: NONE	

Date: 10/26/18
 (E3) MR 11/2/18

Initial GRS

PREPARATION of DILUTIONS

STUDY: 31248 **CLIENT:** AECOM **DILUENT:** CLDS
SPECIES: A. punctulata **TEST:** Suspended Particulate Phase (SPP)

Diluent:	Composite #: 3		Composite #: 4		Composite #: 5		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1,000	0	1,000	0	1,000		
(RW)	0	↓	0	↓	0	↓		
1 %	10	↓	10	↓	10	↓		
10 %	100	↓	100	↓	100	↓		
50 %	500	↓	500	↓	500	↓		
100 %	1,000	↓	1,000	↓	1,000	↓		
Initial	CFS		CFS		CFS			
Date	10/27/18		10/27/18		10/27/18			
Time	0900		0910		0920			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Reference Site Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	24.5		24.2		24.4		@CFS 10/27 27.54	
Vol of Elutriate (mL)	5,340		4,290		4,000		12 @CFS 10/27 4,000	
Grams of Salt (g)	21.5g		18.8g		16.6g		6.39 @CFS 10/27 10/27	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	28.9		28.2		28.7		29.4	
Date & Initial	10/26/18 CFS		10/26/18 CFS		10/26/18 Mw		10/27/18 CFS	

EMBRYO WORKSHEET

DATE: 10/25/18 ²¹ ^{CF} ^{12/13} ESI STUDY: 31248

CLIENT: AECOM PROJECT: New Haven

Eggs Collected @: 1145 Pre-assay fertilization check: 44% ANALYST: CF
^{CF} ^{12/13} 44%
 Sperm Collected @: 1143 *A mated subsample of egg+sperm must achieve ≥90% fertilization in order to be used in testing.*

Egg Stock Suspension Count:

Take 1mL of egg stock suspension and using a glass graduated cylinder dilute with seawater to a final volume of 100 mL. Count a subsample of the diluted suspension to get an estimate of the egg concentration. The diluted suspension should have 40 - 50 eggs/mL, (which would represent an egg concentration of 4,000 - 5,000 in the stock suspension.)

Egg Count (per mL) of diluted suspension: 50

Sperm Stock Suspension Count:

1. Hemocytometer Count (E): 153
 2. Hemocytometer Count (E): 150
 Average Count (E): 152 X10⁴ = sperm solution E = 1.52 x 10⁶
 Sperm Concentrations: Solution E X 40 = Solution B = 6.08 x 10⁷
 Solution E X 20 = Solution C = 3.04 x 10⁷
 Solution E X 5 = Solution D = 7.6 x 10⁶
 Sperm Count (per mL): 1.52 x 10⁶

Once added to the egg stock, the final sperm concentration should be 1x10⁵ - 1x10⁷ in solution E.

mL of Eggs to Add: 100 mL
 mL of Sperm to Add: 20 mL Gametes mixed @: 1235
Gametes must be mixed within 1 hour of collection.

Calculated Embryo Stock Concentration (per mL): 0.833
 Calculated Embryo Stock (mL) needed per chamber: 1.2 mL
The test concentration should be 20 - 30 embryos per mL.

Add calculated amount of embryo stock to a surrogate chamber, gently mix, then count a 5mL aliquot.

Embryo Concentration Check: 128 *If the check concentration is acceptable, then proceed with embryo addition to the test.*

Volume Embryo Stock (mL) added to test solutions: 0.55 mL Embryos Added to Test Solutions @: 1330

INITIAL COUNTS:	Embryos/ 5 mL
SURROGATE A	<u>131</u>
SURROGATE B	<u>126</u>
SURROGATE C	<u>133</u>
Mean:	<u>132</u>

Organism Lot ID: 99ApAR0080118
 Mean per mL: 26

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31248	Client:	AECOM	Project:	New Haven
Test Species:	<i>A. punctulata</i>	Lot ID:	99ApAR0080118	Diluent:	CLDS

DAILY WATER QUALITIES										Ammonia pulled on 100% and Controls	
Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		START	END
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr		
Controls	Lab	8.0	7.6	7.92	8.04	19.0	20.4	31	30.3	-243	331
	CLDS	8.9	7.8	7.95	8.08	18.5	20.5	30	28.1	-244	332
Composite #3	1 %	8.7	7.7	7.95	8.07	18.9	20.0	30	29.6		337
	10 %	8.7	7.5	7.90	8.14	19.0	19.9	30	31.2		334
	50 %	8.3	7.6	7.82	8.25	19.3	19.9	30	31.7		335
	100 %	7.7	7.5	7.76	8.32	19.9	19.9	30	30.9	-240	336
Composite #4	1 %	8.7	7.6	7.92	8.15	19.2	20.1	30	29.4		337
	10 %	8.6	7.7	7.92	8.18	19.2	20.2	30	29.9		338
	50 %	8.4	7.8	7.89	8.31	20.0	20.1	30	29.7		339
	100 %	7.9	7.7	7.87	8.36	20.1	20.0	30	30.0	-241	340
Initials		LCI	CFS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/27	10/30	Exposure				DO Meter #	MLO2	DO Meter #	MLO1
Time		1000	1650			0	24	DO Probe #	160	DO Probe #	96
Incub. Temp		20 21	21	Water Quality Station #		1	2	pH Meter #	MLO2	pH Meter #	MLO1
Comments:		③ CFS 10/30		Thermometer or Probe #		1	159	pH Probe #	163	pH Probe #	158
		Initial		LCI	CFS	Salinity Meter		MLO2	MLO1	Salinity Meter	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31248	Client:	AECOM	Project:	New Haven
Test Species:	<i>A. punctulata</i>	Lot ID:	99ApAR0080118	Diluent:	CLDS

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	START	END
Composite #5	1 %	8.6	7.6	7.93	8.13	19.0	19.8	30	31.2		341
	10 %	8.8	7.6	7.88	8.18	18.3	19.8	29	29.8		342
	50 %	8.4	7.5	7.79	8.30	18.9	19.8	29	29.2		343
	100 %	7.7	7.5	7.70	8.35	20.1	19.9	30	29.8	-242	344
	1 %	/		/		/		/			
	10 %	/		/		/		/			
	50 %	/		/		/		/			
	100 %	/		/		/		/			
Initials	LCI	CFS	RECORD OF METERS USED				WQ Station #1		WQ Station #2		
Date	10/27	10/28 ³⁰	Exposure				DO Meter #	MLO2	DO Meter #	MLO1	
Time	1600	1650		0	24	DO Probe #	160	DO Probe #	96		
Incub. Temp	26.1	21	Water Quality Station #	1	2	pH Meter #	MLO2	pH Meter #	MLO1		
Comments:	©CFS 10/30		Thermometer or Probe #	1	159 [©] MLO1 _{11/10}	pH Probe #	163	pH Probe #	158		
			Initial	LCI	CFS	Salinity Meter	MLO2	Salinity Meter	MLO1		

Arbacia Punctulata Survival / Development Assay

ESI Study: 31248
 Client: AECOM
 Count Date: 11/01/18

Assay Start: 10/27/18 1330
 Assay End: 10/27/18 ~~0800~~ ~~1100~~ ~~1600~~
 Initials: CFS

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Lab Control Water	112 / 110	114 / 113 ^{CS}	112 / 109	112 / 111	117 / 116
CLDS Reference Water	101 / 101	115 / 109	108 / 105	108 / 104	112 / 108
Composite 3 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	64 / 62	85 / 83	99 / 96	73 / 72	83 / 80
10%	21 / 14	31 / 20	23 / 12	21 / 10	25 / 15
50%	4 / 3	5 / 3	5 / 4	3 / 2	2 / 0
100%	1 / 0	0 / 0	0 / 0	1 / 0	0 / 0
Composite 4 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	94 / 93	107 / 107	100 / 98	102 / 101	109 / 107
10%	74 / 72	90 ^{CS} / 83	69 / 39	41 / 18	37 / 23
50%	7 / 1	4 / 0	8 / 0	2 / 0	1 / 0
100%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Composite 5 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	113 / 112	109 / 109	116 / 114	107 / 106	110 / 110
10%	33 / 17	35 / 20	15 / 12	27 / 4	24 / 4
50%	5 / 1	4 / 0	2 / 0	3 / 1	3 / 1
100%	1 / 0	0 / 0	0 / 0	0 / 0	0 / 0

Assay Review Checklist

DATE IN: _____
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: SPPAP

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/27/18	CFS	
Day 1	10/28/18	CFS	Observations
Day 2	10/29/18	CFS	↓
Day 3	10/30/18	CFS	End
Day 4	10/31/18	CFS	Observations
Day 5	11/01/18	CFS	Count
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/6/18	NR	
Statistical Analysis Reviewed	11/6/18	LF (NR)	
Data Acceptability Review	11/6/18	NR	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LABFORMS\ Assay Review Checklist.wpd

Arbacia punctulata
Suspended Particulate Phase
Statistical Analysis Reports
Survival and Development
Unmitigated Assays

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:19 (p 1 of 1)
Test Code/ID: 17-5665-0183/31248Ap-Comp1

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	25 Oct-18 17:35	Species:	Arbacia punctulata	Sample Code:	31246-101		
End Date:	29 Oct-18 11:40	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	25 Oct-18 13:10	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V',W')		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	1	121	99	99	
0	LS	2	10	121	90	89	
0	LS	3	14	121	91	89	
0	LS	4	19	121	98	96	
0	LS	5	28	121	93	90	
0	R	1	3	121	112	107	
0	R	2	12	121	90	88	
0	R	3	16	121	95	90	
0	R	4	22	121	90	86	
0	R	5	29	121	85	89	
1		1	4	121	106	102	
1		2	11	121	89	89	
1		3	17	121	118	117	
1		4	23	121	90	89	
1		5	25	121	118	118	
10		1	5	121	41	21	
10		2	8	121	70	15	
10		3	13	121	43	22	
10		4	20	121	27	5	
10		5	26	121	33	14	
50		1	6	121	0	0	
50		2	9	121	0	0	
50		3	18	121	0	0	
50		4	21	121	0	0	
50		5	30	121	0	0	
100		1	2	121	0	0	
100		2	7	121	0	0	
100		3	15	121	0	0	
100		4	24	121	0	0	
100		5	27	121	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:20 (p 1 of 1)
 Test Code: 31248Ap-Comp1 | 17-5665-0183

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Batch ID:	01-8906-1095	Test Type:	Survival-Development				Analyst:	Nancy Roka			
Start Date:	25 Oct-18 17:35	Protocol:	EPA/600/R-95/136 (1995)				Diluent:	CLDS Reference Site			
Ending Date:	29 Oct-18 11:40	Species:	Arbacia punctulata				Brine:	Not Applicable			
Duration:	90h	Source:	ARO - Aquatic Research Organisms, NH				Age:				
Sample ID:	10-9651-6502	Code:	31246-101				Client:	AECOM			
Sample Date:	25 Oct-18 13:10	Material:	Elutriate Solution				Project:	Dredged Sediment Evaluation			
Receipt Date:	25 Oct-18 13:10	Source:	New Haven Harbor 2018								
Sample Age:	4h	Station:	Comp 1 Elutriate (V,W')								
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method			Level	%	95% LCL	95% UCL	TU	✓	
10-5899-6373	Proportion Normal	Linear Interpolation (ICPIN)			EC50	4.5	3.91	5.08	22.2		
13-2295-3295	Proportion Normal	Spearman-Kärber			EC50	4.31	4.06	4.56	23.22	✓	
09-8954-7466	Proportion Survived	Linear Interpolation (ICPIN)			EC50	7.95	4.88	13.3	12.58		
02-5185-4704	Proportion Survived	Spearman-Kärber			EC50	7.35	6.79	7.95	13.61		
Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.765	0.718	0.813	0.736	0.818	0.017	0.038	4.98%	0.00%
0	R	5	0.760	0.673	0.848	0.711	0.884	0.032	0.070	9.26%	0.65%
1		5	0.851	0.705	0.998	0.736	0.975	0.053	0.118	13.85%	-11.23%
10		5	0.127	0.057	0.197	0.041	0.182	0.025	0.056	44.18%	83.37%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.779	0.737	0.820	0.744	0.818	0.015	0.034	4.34%	0.00%
0	R	5	0.780	0.673	0.887	0.702	0.926	0.039	0.086	11.07%	-0.21%
1		5	0.861	0.715	1.000	0.736	0.975	0.053	0.118	13.71%	-10.62%
10		5	0.354	0.184	0.523	0.223	0.579	0.061	0.136	38.55%	54.56%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.818	0.736	0.736	0.793	0.744					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.843	0.736	0.967	0.736	0.975					
10		0.174	0.124	0.182	0.041	0.116					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.818	0.744	0.752	0.810	0.769					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.876	0.736	0.975	0.744	0.975					
10		0.339	0.579	0.355	0.223	0.273					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 1 of 2)
Test Code: 31248Ap-Comp1 | 17-5665-0183

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 13-2295-3295	Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:04	Analysis: Untrimmed Spearman-Kärber		Official Results: Yes								
Sample ID: 10-9651-6502	Code: 31246-101		Client: AECOM								
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.24	0.00%	0.634	0.0126	4.31	4.06	4.56				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.23	2.82	0.4775	No Outliers Detected						
Proportion Normal Summary			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.806	0.0%
1		5	0.851	0.736	0.975	0.118	13.80%	-12.0%	515/605	0.806	0.0%
10		5	0.127	0.041	0.182	0.056	44.20%	83.3%	77/605	0.127	84.2%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.843	0.736	0.967	0.736	0.975					
10		0.174	0.124	0.182	0.041	0.116					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 2 of 2)
Test Code: 31248Ap-Comp1 | 17-5665-0183

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 02-5185-4704	Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:04	Analysis: Untrimmed Spearman-Kärber		Official Results: Yes								
Sample ID: 10-9651-6502	Code: 31246-101		Client: AECOM								
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.22	0.00%	0.866	0.0171	7.35	6.79	7.95				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.14	2.82	0.6319	No Outliers Detected						
Proportion Survived Summary			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.821	0.0%
1		5	0.861	0.736	0.975	0.118	13.70%	-10.4%	521/605	0.821	0.0%
10		5	0.354	0.223	0.579	0.136	38.50%	54.7%	214/605	0.354	56.9%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.876	0.736	0.975	0.744	0.975					
10		0.339	0.579	0.355	0.223	0.273					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 1 of 2)
Test Code: 31248Ap-Comp1 | 17-5665-0183

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.						
Analysis ID: 10-5899-6373	Endpoint: Proportion Normal					CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:03	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes						
Sample ID: 10-9651-6502	Code: 31246-101					Client: AECOM						
Sample Date: 25 Oct-18 13:10	Material: Elutriate Solution					Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 13:10	Source: New Haven Harbor 2018											
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')											
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1118206	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.23	2.82	0.4775	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	4.5	3.91	5.08	22.2	19.7	25.6						
Proportion Normal Summary			Calculated Variate(A/B)								Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.806	0.0%	
1		5	0.851	0.736	0.975	0.118	13.80%	-12.0%	515/605	0.806	0.0%	
10		5	0.127	0.041	0.182	0.056	44.20%	83.3%	77/605	0.127	84.2%	
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	0.884	0.727	0.744	0.711	0.736						
1		0.843	0.736	0.967	0.736	0.975						
10		0.174	0.124	0.182	0.041	0.116						
50		0.000	0.000	0.000	0.000	0.000						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 2 of 2)
Test Code: 31248Ap-Comp1 | 17-5665-0183

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 09-8954-7466		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:03		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 10-9651-6502		Code: 31246-101			Client: AECOM						
Sample Date: 25 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 4h		Station: Comp 1 Elutriate (V,W')									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1844890	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.14	2.82	0.6319	No Outliers Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	7.95	4.88	13.3	12.58	7.527	20.5					
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.821	0.0%
1		5	0.861	0.736	0.975	0.118	13.70%	-10.4%	521/605	0.821	0.0%
10		5	0.354	0.223	0.579	0.136	38.50%	54.7%	214/605	0.354	56.9%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.876	0.736	0.975	0.744	0.975					
10		0.339	0.579	0.355	0.223	0.273					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:20 (p 1 of 1)
Test Code/ID: 09-9201-7337/31248Ap-Comp2

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	25 Oct-18 17:35	Species:	Arbacia punctulata	Sample Code:	31246-103		
End Date:	29 Oct-18 11:40	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	25 Oct-18 14:05	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	1	121	99	99	
0	LS	2	12	121	90	89	
0	LS	3	16	121	91	89	
0	LS	4	21	121	98	96	
0	LS	5	28	121	93	90	
0	R	1	5	121	112	107	
0	R	2	7	121	90	88	
0	R	3	15	121	95	90	
0	R	4	24	121	90	86	
0	R	5	27	121	85	89	
1		1	6	121	119	117	
1		2	8	121	97	95	
1		3	13	122	122	121	
1		4	19	121	101	100	
1		5	26	122	122	122	
10		1	3	121	62	11	
10		2	11	121	94	7	
10		3	17	121	72	11	
10		4	20	121	71	9	
10		5	30	121	80	9	
50		1	2	121	0	0	
50		2	9	121	0	0	
50		3	18	121	0	0	
50		4	23	121	0	0	
50		5	25	121	0	0	
100		1	4	121	0	0	
100		2	10	121	0	0	
100		3	14	121	0	0	
100		4	22	121	0	0	
100		5	29	121	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:21 (p 1 of 1)
Test Code: 31248Ap-Comp2 | 09-9201-7337

Echinoid Embryo-Larval Survival and Development Test **EnviroSystems, Inc.**

Batch ID: 01-8906-1095	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 25 Oct-18 17:35	Protocol: EPA/600/R-95/136 (1995)	Diluent: CLDS Reference Site
Ending Date: 29 Oct-18 11:40	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 90h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 01-6129-8063	Code: 31246-103	Client: AECOM
Sample Date: 25 Oct-18 14:05	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 25 Oct-18 14:05	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
00-4868-9646	Proportion Normal	Linear Interpolation (ICPIN)	EC50	4.12	4	4.22	24.29	
11-9630-4025	Proportion Normal	Spearman-Kärber	EC50	3.79	3.62	3.97	26.37	✓
11-3535-9951	Proportion Survived	Linear Interpolation (ICPIN)	EC50	17	13	20.9	5.894	
18-1116-1258	Proportion Survived	Spearman-Kärber	EC50	13.3	12.4	14.3	7.508	

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.765	0.718	0.813	0.736	0.818	0.017	0.038	4.98%	0.00%
0	R	5	0.760	0.673	0.848	0.711	0.884	0.032	0.070	9.26%	0.65%
1		5	0.914	0.789	1.000	0.785	1.000	0.045	0.101	11.01%	-19.44%
10		5	0.078	0.061	0.095	0.058	0.091	0.006	0.014	17.80%	89.85%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.779	0.737	0.820	0.744	0.818	0.015	0.034	4.34%	0.00%
0	R	5	0.780	0.673	0.887	0.702	0.926	0.039	0.086	11.07%	-0.21%
1		5	0.924	0.803	1.000	0.802	1.000	0.044	0.098	10.55%	-18.68%
10		5	0.626	0.503	0.750	0.512	0.777	0.044	0.099	15.84%	19.53%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.818	0.736	0.736	0.793	0.744	
0	R	0.884	0.727	0.744	0.711	0.736	
1		0.967	0.785	0.992	0.826	1.000	
10		0.091	0.058	0.091	0.074	0.074	
50		0.000	0.000	0.000	0.000	0.000	
100		0.000	0.000	0.000	0.000	0.000	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.818	0.744	0.752	0.810	0.769	
0	R	0.926	0.744	0.785	0.744	0.702	
1		0.983	0.802	1.000	0.835	1.000	
10		0.512	0.777	0.595	0.587	0.661	
50		0.000	0.000	0.000	0.000	0.000	
100		0.000	0.000	0.000	0.000	0.000	

CETIS Analytical Report

Report Date: 07 Nov-18 14:21 (p 1 of 2)
Test Code: 31248Ap-Comp2 | 09-9201-7337

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 11-9630-4025	Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:07	Analysis: Untrimmed Spearman-Kärber			Official Results: Yes							
Sample ID: 01-6129-8063	Code: 31246-103			Client: AECOM							
Sample Date: 25 Oct-18 14:05	Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 14:05	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 2 Elutriate (R',S')										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.24	0.00%	0.579	0.01	3.79	3.62	3.97				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.63	2.82	0.1153	No Outliers Detected						
Proportion Normal Summary											
			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.837	0.0%
1		5	0.914	0.785	1.000	0.101	11.00%	-20.2%	555/607	0.837	0.0%
10		5	0.078	0.058	0.091	0.014	17.80%	89.8%	47/605	0.0777	90.7%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.967	0.785	0.992	0.826	1.000					
10		0.091	0.058	0.091	0.074	0.074					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:21 (p 2 of 2)
Test Code: 31248Ap-Comp2 | 09-9201-7337

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 18-1116-1258	Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:07	Analysis: Untrimmed Spearman-Kärber		Official Results: Yes								
Sample ID: 01-6129-8063	Code: 31246-103		Client: AECOM								
Sample Date: 25 Oct-18 14:05	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 25 Oct-18 14:05	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 2 Elutriate (R',S')										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.22	0.00%	1.12	0.0152	13.3	12.4	14.3				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.29	2.82	0.4015	No Outliers Detected						
Proportion Survived Summary											
			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.852	0.0%
1		5	0.924	0.802	1.000	0.098	10.60%	-18.4%	561/607	0.852	0.0%
10		5	0.626	0.512	0.777	0.099	15.80%	19.7%	379/605	0.626	26.5%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.983	0.802	1.000	0.835	1.000					
10		0.512	0.777	0.595	0.587	0.661					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 1 of 2)
Test Code: 31248Ap-Comp2 | 09-9201-7337

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.						
Analysis ID: 00-4868-9646	Endpoint: Proportion Normal					CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:07	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes						
Sample ID: 01-6129-8063	Code: 31246-103					Client: AECOM						
Sample Date: 25 Oct-18 14:05	Material: Elutriate Solution					Project: Dredged Sediment Evaluation						
Receipt Date: 25 Oct-18 14:05	Source: New Haven Harbor 2018											
Sample Age: 4h	Station: Comp 2 Elutriate (R',S')											
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1696766	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.63	2.82	0.1153	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	4.12	4	4.22	24.29	23.68	25.02						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.837	0.0%	
1		5	0.914	0.785	1.000	0.101	11.00%	-20.2%	555/607	0.837	0.0%	
10		5	0.078	0.058	0.091	0.014	17.80%	89.8%	47/605	0.0777	90.7%	
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	0.884	0.727	0.744	0.711	0.736						
1		0.967	0.785	0.992	0.826	1.000						
10		0.091	0.058	0.091	0.074	0.074						
50		0.000	0.000	0.000	0.000	0.000						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Analytical Report

Report Date: 07 Nov-18 14:20 (p 2 of 2)
Test Code: 31248Ap-Comp2 | 09-9201-7337

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 11-3535-9951		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:07		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 01-6129-8063		Code: 31246-103			Client: AECOM							
Sample Date: 25 Oct-18 14:05		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 14:05		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	2030245	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.29	2.82	0.4015	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	17	13	20.9	5.894	4.796	7.707						
Proportion Survived Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.852	0.0%	
1		5	0.924	0.802	1.000	0.098	10.60%	-18.4%	561/607	0.852	0.0%	
10		5	0.626	0.512	0.777	0.099	15.80%	19.7%	379/605	0.626	26.5%	
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	0.926	0.744	0.785	0.744	0.702						
1		0.983	0.802	1.000	0.835	1.000						
10		0.512	0.777	0.595	0.587	0.661						
50		0.000	0.000	0.000	0.000	0.000						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:21 (p 1 of 1)
Test Code/ID: 05-7027-4949/31248Ap-Comp3

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	27 Oct-18 13:30	Species:	Arbacia punctulata	Sample Code:	31246-105		
End Date:	30 Oct-18 16:00	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	26 Oct-18 16:15	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	1	132	112	110	
0	LS	2	8	132	114	113	
0	LS	3	14	132	112	109	
0	LS	4	19	132	112	111	
0	LS	5	30	132	117	116	
0	R	1	2	132	111	101	
0	R	2	9	132	115	109	
0	R	3	15	132	109	105	
0	R	4	22	132	108	104	
0	R	5	29	132	112	108	
1		1	3	132	64	62	
1		2	10	132	85	83	
1		3	13	132	99	96	
1		4	23	132	73	72	
1		5	25	132	83	80	
10		1	6	132	21	14	
10		2	11	132	31	20	
10		3	17	132	23	12	
10		4	21	132	21	10	
10		5	26	132	25	15	
50		1	4	132	4	3	
50		2	12	132	5	3	
50		3	16	132	5	4	
50		4	24	132	3	2	
50		5	27	132	2	0	
100		1	5	132	1	0	
100		2	7	132	0	0	
100		3	18	132	0	0	
100		4	20	132	1	0	
100		5	28	132	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:22 (p 1 of 1)
 Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Batch ID:	08-6440-3077	Test Type:	Survival-Development				Analyst:	Nancy Roka			
Start Date:	27 Oct-18 13:30	Protocol:	EPA/600/R-95/136 (1995)				Diluent:	CLDS Reference Site			
Ending Date:	30 Oct-18 16:00	Species:	Arbacia punctulata				Brine:	Not Applicable			
Duration:	74h	Source:	ARO - Aquatic Research Organisms, NH				Age:				
Sample ID:	16-4987-4855	Code:	31246-105				Client:	AECOM			
Sample Date:	26 Oct-18 16:15	Material:	Elutriate Solution				Project:	Dredged Sediment Evaluation			
Receipt Date:	26 Oct-18 16:15	Source:	New Haven Harbor 2018								
Sample Age:	21h	Station:	Comp 3 Elutriate (US-1,-2)								
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method				Level	%	95% LCL	95% UCL	TU	✓
11-7014-6790	Proportion Normal	Linear Interpolation (ICPIN)				EC50	2.97	1.94	3.85	33.67	
14-3593-8089	Proportion Normal	Trimmed Spearman-Kärber				EC50	2.52	2.32	2.75	39.61	
18-0632-9859	Proportion Survived	Linear Interpolation (ICPIN)				EC50	3.29	2.04	4.42	30.44	
21-2593-9624	Proportion Survived	Linear Interpolation (ICPIN)				EC50	2.95	1.86	3.87	33.94	
14-0592-5898	Proportion Survived	Trimmed Spearman-Kärber				EC50	2.8	2.51	3.12	35.73	
21-3690-6453	Proportion Survived	Trimmed Spearman-Kärber				EC50	2.5	2.19	2.87	39.93	✓
Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.847	0.821	0.873	0.826	0.879	0.009	0.021	2.48%	0.00%
0	R	5	0.798	0.768	0.829	0.765	0.826	0.011	0.024	3.04%	5.72%
1		5	0.595	0.476	0.715	0.470	0.727	0.043	0.096	16.13%	29.70%
10		5	0.108	0.072	0.143	0.076	0.152	0.013	0.029	26.54%	87.30%
50		5	0.018	0.004	0.032	0.000	0.030	0.005	0.012	63.19%	97.85%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.859	0.838	0.880	0.848	0.886	0.007	0.017	1.93%	0.00%
0	R	5	0.841	0.815	0.867	0.818	0.871	0.009	0.021	2.47%	2.12%
1		5	0.612	0.488	0.736	0.485	0.750	0.045	0.100	16.33%	28.75%
10		5	0.183	0.144	0.222	0.159	0.235	0.014	0.031	17.14%	78.66%
50		5	0.029	0.017	0.041	0.015	0.038	0.004	0.010	34.31%	96.65%
100		5	0.003	0.000	0.008	0.000	0.008	0.002	0.004	136.93%	99.65%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.833	0.856	0.826	0.841	0.879					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.470	0.629	0.727	0.545	0.606					
10		0.106	0.152	0.091	0.076	0.114					
50		0.023	0.023	0.030	0.015	0.000					
100		0.000	0.000	0.000	0.000	0.000					
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.848	0.864	0.848	0.848	0.886					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.485	0.644	0.750	0.553	0.629					
10		0.159	0.235	0.174	0.159	0.189					
50		0.030	0.038	0.038	0.023	0.015					
100		0.008	0.000	0.000	0.008	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:22 (p 1 of 3)
Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 14-3593-8089	Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:09	Analysis: Trimmed Spearman-Kärber		Official Results: Yes								
Sample ID: 16-4987-4855	Code: 31246-105		Client: AECOM								
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 21h	Station: Comp 3 Elutriate (US-1,-2)										
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.202	25.43%	0.402	0.0187	2.52	2.32	2.75				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.73	2.82	0.0762	No Outliers Detected						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.798	0.0%
1		5	0.595	0.470	0.727	0.096	16.10%	25.4%	393/660	0.595	25.4%
10		5	0.108	0.076	0.152	0.029	26.50%	86.5%	71/660	0.108	86.5%
50		5	0.018	0.000	0.030	0.012	63.20%	97.7%	12/660	0.0182	97.7%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.470	0.629	0.727	0.545	0.606					
10		0.106	0.152	0.091	0.076	0.114					
50		0.023	0.023	0.030	0.015	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:22 (p 2 of 3)
Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID:	14-0592-5898	Endpoint:	Proportion Survived				CETIS Version:	CETISv1.9.3			
Analyzed:	07 Nov-18 10:09	Analysis:	Trimmed Spearman-Kärber				Official Results:	Yes			
Sample ID:	16-4987-4855	Code:	31246-105				Client:	AECOM			
Sample Date:	26 Oct-18 16:15	Material:	Elutriate Solution				Project:	Dredged Sediment Evaluation			
Receipt Date:	26 Oct-18 16:15	Source:	New Haven Harbor 2018								
Sample Age:	21h	Station:	Comp 3 Elutriate (US-1,-2)								
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.159	27.21%	0.447	0.0235	2.8	2.51	3.12				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.95	2.82	0.0270	Outlier Detected						
Proportion Survived Summary											
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate	
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.612	0.485	0.750	0.100	16.30%	27.2%	404/660	0.612	27.2%
10		5	0.183	0.159	0.235	0.031	17.10%	78.2%	121/660	0.183	78.2%
50		5	0.029	0.015	0.038	0.010	34.30%	96.6%	19/660	0.0288	96.6%
100		5	0.003	0.000	0.008	0.004	137.00%	99.6%	2/660	0.00303	99.6%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.485	0.644	0.750	0.553	0.629					
10		0.159	0.235	0.174	0.159	0.189					
50		0.030	0.038	0.038	0.023	0.015					
100		0.008	0.000	0.000	0.008	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:22 (p 3 of 3)
Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 21-3690-6453		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:09		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 16-4987-4855		Code: 31246-105			Client: AECOM						
Sample Date: 26 Oct-18 16:15		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 16:15		Source: New Haven Harbor 2018									
Sample Age: 21h		Station: Comp 3 Elutriate (US-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.159	31.31%	0.399	0.0293	2.5	2.19	2.87				
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		4	0.578	0.485	0.644	0.074	12.70%	31.3%	305/528	0.578	31.3%
10		5	0.183	0.159	0.235	0.031	17.10%	78.2%	121/660	0.183	78.2%
50		5	0.029	0.015	0.038	0.010	34.30%	96.6%	19/660	0.0288	96.6%
100		5	0.003	0.000	0.008	0.004	137.00%	99.6%	2/660	0.00303	99.6%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.485	0.644	Outlier	0.553	0.629					
10		0.159	0.235	0.174	0.159	0.189					
50		0.030	0.038	0.038	0.023	0.015					
100		0.008	0.000	0.000	0.008	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:22 (p 1 of 2)
Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 11-7014-6790	Endpoint: Proportion Normal					CETIS Version: CETISv1.9.3					
Analyzed: 07 Nov-18 10:09	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes					
Sample ID: 16-4987-4855	Code: 31246-105					Client: AECOM					
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution					Project: Dredged Sediment Evaluation					
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 21h	Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	176549	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.73	2.82	0.0762	No Outliers Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	2.97	1.94	3.85	33.67	25.95	51.66					
Proportion Normal Summary											
			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.798	0.0%
1		5	0.595	0.470	0.727	0.096	16.10%	25.4%	393/660	0.595	25.4%
10		5	0.108	0.076	0.152	0.029	26.50%	86.5%	71/660	0.108	86.5%
50		5	0.018	0.000	0.030	0.012	63.20%	97.7%	12/660	0.0182	97.7%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.470	0.629	0.727	0.545	0.606					
10		0.106	0.152	0.091	0.076	0.114					
50		0.023	0.023	0.030	0.015	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:22 (p 2 of 2)
Test Code: 31248Ap-Comp3 | 05-7027-4949

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 21-2593-9624	Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:09	Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Sample ID: 16-4987-4855	Code: 31246-105		Client: AECOM								
Sample Date: 26 Oct-18 16:15	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 26 Oct-18 16:15	Source: New Haven Harbor 2018										
Sample Age: 21h	Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1565812	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	2.95	1.86	3.87	33.94	25.84	53.89					
Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		4	0.578	0.485	0.644	0.074	12.70%	31.3%	305/528	0.578	31.3%
10		5	0.183	0.159	0.235	0.031	17.10%	78.2%	121/660	0.183	78.2%
50		5	0.029	0.015	0.038	0.010	34.30%	96.6%	19/660	0.0288	96.6%
100		5	0.003	0.000	0.008	0.004	137.00%	99.6%	2/660	0.00303	99.6%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.485	0.644	Outlier	0.553	0.629					
10		0.159	0.235	0.174	0.159	0.189					
50		0.030	0.038	0.038	0.023	0.015					
100		0.008	0.000	0.000	0.008	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:22 (p 1 of 1)
Test Code/ID: 10-9997-5469/31248Ap-Comp4

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	27 Oct-18 13:30	Species:	Arbacia punctulata	Sample Code:	31246-107		
End Date:	30 Oct-18 16:00	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	26 Oct-18 13:10	Material:	Elutriate Solution	Sample Station:	Comp 4 Elutriate (DS-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	3	132	112	110	
0	LS	2	12	132	114	113	
0	LS	3	17	132	112	109	
0	LS	4	24	132	112	111	
0	LS	5	26	132	117	116	
0	R	1	2	132	111	101	
0	R	2	7	132	115	109	
0	R	3	16	132	109	105	
0	R	4	22	132	108	104	
0	R	5	30	132	112	108	
1		1	5	132	94	93	
1		2	9	132	107	107	
1		3	15	132	100	98	
1		4	21	132	102	101	
1		5	25	132	109	107	
10		1	6	132	74	72	
10		2	8	132	97	83	
10		3	14	132	69	39	
10		4	19	132	41	18	
10		5	29	132	37	23	
50		1	1	132	7	1	
50		2	11	132	4	0	
50		3	13	132	8	0	
50		4	23	132	2	0	
50		5	27	132	1	0	
100		1	4	132	0	0	
100		2	10	132	0	0	
100		3	18	132	0	0	
100		4	20	132	0	0	
100		5	28	132	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:23 (p 1 of 1)
 Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test	EnviroSystems, Inc.
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Batch ID: 08-6440-3077	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 27 Oct-18 13:30	Protocol: EPA/600/R-95/136 (1995)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 16:00	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 74h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 04-7608-3506	Code: 31246-107	Client: AECOM
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018	
Sample Age: 24h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary									
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓	
12-6821-5947	Proportion Normal	Linear Interpolation (ICPIN)	EC50	8.19	3.07	18.9	12.2		
17-3062-8048	Proportion Normal	Linear Interpolation (ICPIN)	EC50	6.4	3.53	15.1	15.63		
01-9830-2170	Proportion Normal	Trimmed Spearman-Kärber	EC50	7.27	6.68	7.91	13.75		
02-0458-4071	Proportion Normal	Trimmed Spearman-Kärber	EC50	6.07	5.54	6.64	16.48	✓	
16-4918-0573	Proportion Survived	Linear Interpolation (ICPIN)	EC50	9.9	4.02	17.2	10.1		
21-2082-5713	Proportion Survived	Linear Interpolation (ICPIN)	EC50	12.6	4.8	20	7.956		
10-7448-5166	Proportion Survived	Trimmed Spearman-Kärber	EC50	9.63	8.76	10.6	10.39		
14-5854-1799	Proportion Survived	Trimmed Spearman-Kärber	EC50	8.09	7.29	8.99	12.36		

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.847	0.821	0.873	0.826	0.879	0.009	0.021	2.48%	0.00%
0	R	5	0.798	0.768	0.829	0.765	0.826	0.011	0.024	3.04%	5.72%
1		5	0.767	0.710	0.823	0.705	0.811	0.020	0.046	5.95%	9.48%
10		5	0.356	0.082	0.630	0.136	0.629	0.099	0.221	62.05%	57.96%
50		5	0.002	0.000	0.006	0.000	0.008	0.002	0.003	223.61%	99.82%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.859	0.838	0.880	0.848	0.886	0.007	0.017	1.93%	0.00%
0	R	5	0.841	0.815	0.867	0.818	0.871	0.009	0.021	2.47%	2.12%
1		5	0.776	0.720	0.832	0.712	0.826	0.020	0.045	5.80%	9.70%
10		5	0.482	0.248	0.716	0.280	0.735	0.084	0.188	39.08%	43.92%
50		5	0.033	0.005	0.062	0.008	0.061	0.010	0.023	69.31%	96.12%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.833	0.856	0.826	0.841	0.879	
0	R	0.765	0.826	0.795	0.788	0.818	
1		0.705	0.811	0.742	0.765	0.811	
10		0.545	0.629	0.295	0.136	0.174	
50		0.008	0.000	0.000	0.000	0.000	
100		0.000	0.000	0.000	0.000	0.000	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.848	0.864	0.848	0.848	0.886	
0	R	0.841	0.871	0.826	0.818	0.848	
1		0.712	0.811	0.758	0.773	0.826	
10		0.561	0.735	0.523	0.311	0.280	
50		0.053	0.030	0.061	0.015	0.008	
100		0.000	0.000	0.000	0.000	0.000	

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 1 of 2)
Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 02-0458-4071		Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:10		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 04-7608-3506		Code: 31246-107			Client: AECOM						
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 24h		Station: Comp 4 Elutriate (DS-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.202	3.98%	0.783	0.0196	6.07	5.54	6.64				
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.798	0.0%
1		5	0.767	0.705	0.811	0.046	5.95%	3.98%	506/660	0.767	3.98%
10		4	0.288	0.136	0.545	0.185	64.10%	63.9%	152/528	0.288	63.9%
50		5	0.002	0.000	0.008	0.003	224.00%	99.8%	1/660	0.00152	99.8%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.705	0.811	0.742	0.765	0.811					
10		0.545	Outlier	0.295	0.136	0.174					
50		0.008	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 2 of 2)
Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 14-5854-1799	Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3								
Analyzed: 07 Nov-18 10:10	Analysis: Trimmed Spearman-Kärber		Official Results: Yes								
Sample ID: 04-7608-3506	Code: 31246-107		Client: AECOM								
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 24h	Station: Comp 4 Elutriate (DS-1,-2)										
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.159	7.75%	0.908	0.0228	8.09	7.29	8.99				
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.776	0.712	0.826	0.045	5.80%	7.75%	512/660	0.776	7.75%
10		4	0.419	0.280	0.561	0.144	34.30%	50.2%	221/528	0.419	50.2%
50		5	0.033	0.008	0.061	0.023	69.30%	96.0%	22/660	0.0333	96.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.712	0.811	0.758	0.773	0.826					
10		0.561	Outlier	0.523	0.311	0.280					
50		0.053	0.030	0.061	0.015	0.008					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 1 of 3)
Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 17-3062-8048		Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:10		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Sample ID: 04-7608-3506		Code: 31246-107		Client: AECOM							
Sample Date: 26 Oct-18 13:10		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 13:10		Source: New Haven Harbor 2018									
Sample Age: 24h		Station: Comp 4 Elutriate (DS-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1790955	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	6.4	3.53	15.1	15.63	6.634	28.33					
Proportion Normal Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.798	0.0%
1		5	0.767	0.705	0.811	0.046	5.95%	3.98%	506/660	0.767	3.98%
10		4	0.288	0.136	0.545	0.185	64.10%	63.9%	152/528	0.288	63.9%
50		5	0.002	0.000	0.008	0.003	224.00%	99.8%	1/660	0.00152	99.8%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.705	0.811	0.742	0.765	0.811					
10		0.545	Outlier	0.295	0.136	0.174					
50		0.008	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 2 of 3)
Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 21-2082-5713	Endpoint: Proportion Survived					CETIS Version: CETISv1.9.3					
Analyzed: 07 Nov-18 10:10	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes					
Sample ID: 04-7608-3506	Code: 31246-107					Client: AECOM					
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution					Project: Dredged Sediment Evaluation					
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 24h	Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	696206	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.99	2.82	0.0217	Outlier Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	12.6	4.8	20	7.956	5.011	20.84					
Proportion Survived Summary			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.776	0.712	0.826	0.045	5.80%	7.75%	512/660	0.776	7.75%
10		5	0.482	0.280	0.735	0.188	39.10%	42.7%	318/660	0.482	42.7%
50		5	0.033	0.008	0.061	0.023	69.30%	96.0%	22/660	0.0333	96.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.712	0.811	0.758	0.773	0.826					
10		0.561	0.735	0.523	0.311	0.280					
50		0.053	0.030	0.061	0.015	0.008					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 3 of 3)
Test Code: 31248Ap-Comp4 | 10-9997-5469

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 16-4918-0573	Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:10	Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7608-3506	Code: 31246-107			Client: AECOM							
Sample Date: 26 Oct-18 13:10	Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 13:10	Source: New Haven Harbor 2018										
Sample Age: 24h	Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	439136	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	9.9	4.02	17.2	10.1	5.812	24.89					
Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.776	0.712	0.826	0.045	5.80%	7.75%	512/660	0.776	7.75%
10		4	0.419	0.280	0.561	0.144	34.30%	50.2%	221/528	0.419	50.2%
50		5	0.033	0.008	0.061	0.023	69.30%	96.0%	22/660	0.0333	96.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.712	0.811	0.758	0.773	0.826					
10		0.561	Outlier	0.523	0.311	0.280					
50		0.053	0.030	0.061	0.015	0.008					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:23 (p 1 of 1)
Test Code/ID: 11-6976-8011/31248Ap-Comp5

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	27 Oct-18 13:30	Species:	Arbacia punctulata	Sample Code:	31246-109		
End Date:	30 Oct-18 16:00	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	26 Oct-18 15:25	Material:	Elutriate Solution	Sample Station:	Comp 5 Elutriate (TB-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	1	132	112	110	
0	LS	2	8	132	114	113	
0	LS	3	13	132	112	109	
0	LS	4	20	132	112	111	
0	LS	5	25	132	117	116	
0	R	1	4	132	111	101	
0	R	2	7	132	115	109	
0	R	3	15	132	109	105	
0	R	4	21	132	108	104	
0	R	5	26	132	112	108	
1		1	5	132	113	112	
1		2	10	132	109	109	
1		3	17	132	116	114	
1		4	22	132	107	106	
1		5	30	132	110	110	
10		1	3	132	33	17	
10		2	11	132	35	20	
10		3	14	132	15	12	
10		4	19	132	27	4	
10		5	29	132	24	4	
50		1	2	132	5	1	
50		2	12	132	4	0	
50		3	18	132	2	0	
50		4	24	132	3	1	
50		5	27	132	3	1	
100		1	6	132	1	0	
100		2	9	132	0	0	
100		3	16	132	0	0	
100		4	23	132	0	0	
100		5	28	132	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:24 (p 1 of 1)
 Test Code: 31248Ap-Comp5 | 11-6976-8011

Echinoid Embryo-Larval Survival and Development Test	EnviroSystems, Inc.
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Batch ID: 08-6440-3077	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 27 Oct-18 13:30	Protocol: EPA/600/R-95/136 (1995)	Diluent: CLDS Reference Site
Ending Date: 30 Oct-18 16:00	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 74h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 02-4334-9766	Code: 31246-109	Client: AECOM
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018	
Sample Age: 22h	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
02-9580-9873	Proportion Normal	Linear Interpolation (ICPIN)	EC50	4.19	3.84	4.78	23.88	
17-2200-8161	Proportion Normal	Spearman-Kärber	EC50	3.91	3.73	4.1	25.55	✓
05-7757-9822	Proportion Survived	Linear Interpolation (ICPIN)	EC50	5.41	4.83	6.07	18.49	
18-4137-4170	Proportion Survived	Linear Interpolation (ICPIN)	EC50	5.15	4.32	5.86	19.41	
00-2978-8288	Proportion Survived	Trimmed Spearman-Kärber	EC50	5.53	5.11	5.97	18.1	
10-9281-2384	Proportion Survived	Trimmed Spearman-Kärber	EC50	5.24	4.9	5.61	19.07	

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.847	0.821	0.873	0.826	0.879	0.009	0.021	2.48%	0.00%
0	R	5	0.798	0.768	0.829	0.765	0.826	0.011	0.024	3.04%	5.72%
1		5	0.835	0.806	0.863	0.803	0.864	0.010	0.023	2.75%	1.43%
10		5	0.086	0.017	0.155	0.030	0.152	0.025	0.056	64.34%	89.80%
50		5	0.005	0.000	0.010	0.000	0.008	0.002	0.004	91.29%	99.46%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.859	0.838	0.880	0.848	0.886	0.007	0.017	1.93%	0.00%
0	R	5	0.841	0.815	0.867	0.818	0.871	0.009	0.021	2.47%	2.12%
1		5	0.841	0.808	0.874	0.811	0.879	0.012	0.027	3.19%	2.12%
10		5	0.203	0.128	0.278	0.114	0.265	0.027	0.060	29.66%	76.37%
50		5	0.026	0.015	0.037	0.015	0.038	0.004	0.009	33.53%	97.00%
100		5	0.002	0.000	0.006	0.000	0.008	0.002	0.003	223.61%	99.82%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.833	0.856	0.826	0.841	0.879	
0	R	0.765	0.826	0.795	0.788	0.818	
1		0.848	0.826	0.864	0.803	0.833	
10		0.129	0.152	0.091	0.030	0.030	
50		0.008	0.000	0.000	0.008	0.008	
100		0.000	0.000	0.000	0.000	0.000	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LS	0.848	0.864	0.848	0.848	0.886	
0	R	0.841	0.871	0.826	0.818	0.848	
1		0.856	0.826	0.879	0.811	0.833	
10		0.250	0.265	0.114	0.205	0.182	
50		0.038	0.030	0.015	0.023	0.023	
100		0.008	0.000	0.000	0.000	0.000	

CETIS Analytical Report

Report Date: 07 Nov-18 14:24 (p 1 of 2)
Test Code: 31248Ap-Comp5 | 11-6976-8011

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 17-2200-8161	Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:12	Analysis: Untrimmed Spearman-Kärber			Official Results: Yes							
Sample ID: 02-4334-9766	Code: 31246-109			Client: AECOM							
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018										
Sample Age: 22h	Station: Comp 5 Elutriate (TB-1,-2)										
Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.202	0.00%	0.593	0.0103	3.91	3.73	4.1				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.42	2.82	0.2538	No Outliers Detected						
Proportion Normal Summary											
			Calculated Variate(A/B)						Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.817	0.0%
1		5	0.835	0.803	0.864	0.023	2.75%	-4.55%	551/660	0.817	0.0%
10		5	0.086	0.030	0.152	0.056	64.30%	89.2%	57/660	0.0864	89.4%
50		5	0.005	0.000	0.008	0.004	91.30%	99.4%	3/660	0.00455	99.4%
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.765	0.826	0.795	0.788	0.818					
1		0.848	0.826	0.864	0.803	0.833					
10		0.129	0.152	0.091	0.030	0.030					
50		0.008	0.000	0.000	0.008	0.008					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:24 (p 2 of 2)
Test Code: 31248Ap-Comp5 | 11-6976-8011

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 00-2978-8288		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:12		Analysis: Trimmed Spearman-Kärber			Official Results: Yes						
Sample ID: 02-4334-9766		Code: 31246-109			Client: AECOM						
Sample Date: 26 Oct-18 15:25		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 15:25		Source: New Haven Harbor 2018									
Sample Age: 22h		Station: Comp 5 Elutriate (TB-1,-2)									
Trimmed Spearman-Kärber Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.159	0.18%	0.742	0.0168	5.53	5.11	5.97				
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.841	0.811	0.879	0.027	3.19%	0.0%	555/660	0.841	0.0%
10		4	0.225	0.182	0.265	0.039	17.20%	73.2%	119/528	0.225	73.2%
50		5	0.026	0.015	0.038	0.009	33.50%	96.9%	17/660	0.0258	96.9%
100		5	0.002	0.000	0.008	0.003	224.00%	99.8%	1/660	0.00152	99.8%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.856	0.826	0.879	0.811	0.833					
10		0.250	0.265	Outlier	0.205	0.182					
50		0.038	0.030	0.015	0.023	0.023					
100		0.008	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 1 of 2)
Test Code: 31248Ap-Comp5 | 11-6976-8011

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.						
Analysis ID: 02-9580-9873	Endpoint: Proportion Normal					CETIS Version: CETISv1.9.3						
Analyzed: 07 Nov-18 10:12	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes						
Sample ID: 02-4334-9766	Code: 31246-109					Client: AECOM						
Sample Date: 26 Oct-18 15:25	Material: Elutriate Solution					Project: Dredged Sediment Evaluation						
Receipt Date: 26 Oct-18 15:25	Source: New Haven Harbor 2018											
Sample Age: 22h	Station: Comp 5 Elutriate (TB-1,-2)											
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	819509	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.42	2.82	0.2538	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	4.19	3.84	4.78	23.88	20.93	26.05						
Proportion Normal Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	R	5	0.798	0.765	0.826	0.024	3.04%	0.0%	527/660	0.817	0.0%	
1		5	0.835	0.803	0.864	0.023	2.75%	-4.55%	551/660	0.817	0.0%	
10		5	0.086	0.030	0.152	0.056	64.30%	89.2%	57/660	0.0864	89.4%	
50		5	0.005	0.000	0.008	0.004	91.30%	99.4%	3/660	0.00455	99.4%	
100		5	0.000	0.000	0.000	0.000		100.0%	0/660	0	100.0%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	R	0.765	0.826	0.795	0.788	0.818						
1		0.848	0.826	0.864	0.803	0.833						
10		0.129	0.152	0.091	0.030	0.030						
50		0.008	0.000	0.000	0.008	0.008						
100		0.000	0.000	0.000	0.000	0.000						

CETIS Analytical Report

Report Date: 07 Nov-18 14:23 (p 2 of 2)
Test Code: 31248Ap-Comp5 | 11-6976-8011

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 05-7757-9822		Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:12		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Sample ID: 02-4334-9766		Code: 31246-109		Client: AECOM							
Sample Date: 26 Oct-18 15:25		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 26 Oct-18 15:25		Source: New Haven Harbor 2018									
Sample Age: 22h		Station: Comp 5 Elutriate (TB-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	830761	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	5.41	4.83	6.07	18.49	16.48	20.69					
Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.841	0.818	0.871	0.021	2.47%	0.0%	555/660	0.841	0.0%
1		5	0.841	0.811	0.879	0.027	3.19%	0.0%	555/660	0.841	0.0%
10		4	0.225	0.182	0.265	0.039	17.20%	73.2%	119/528	0.225	73.2%
50		5	0.026	0.015	0.038	0.009	33.50%	96.9%	17/660	0.0258	96.9%
100		5	0.002	0.000	0.008	0.003	224.00%	99.8%	1/660	0.00152	99.8%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.841	0.871	0.826	0.818	0.848					
1		0.856	0.826	0.879	0.811	0.833					
10		0.250	0.265	Outlier	0.205	0.182					
50		0.038	0.030	0.015	0.023	0.023					
100		0.008	0.000	0.000	0.000	0.000					

CETIS Test Data Worksheet

Report Date: 07 Nov-18 14:24 (p 1 of 1)
Test Code/ID: 04-3358-7078/31248Ap-Comp6

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	25 Oct-18 17:35	Species:	Arbacia punctulata	Sample Code:	31246-111		
End Date:	29 Oct-18 11:40	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	25 Oct-18 15:20	Material:	Elutriate Solution	Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	5	121	99	99	
0	LS	2	12	121	90	89	
0	LS	3	16	121	91	89	
0	LS	4	20	121	98	96	
0	LS	5	27	121	93	90	
0	R	1	4	121	112	107	
0	R	2	8	121	90	88	
0	R	3	15	121	95	90	
0	R	4	22	121	90	86	
0	R	5	30	121	85	89	
1		1	1	121	113	113	
1		2	11	121	112	112	
1		3	17	121	121	120	
1		4	23	121	95	95	
1		5	28	121	119	119	
10		1	6	121	101	101	
10		2	7	121	118	116	
10		3	14	121	109	107	
10		4	24	121	114	113	
10		5	25	121	107	107	
50		1	3	121	0	0	
50		2	10	121	0	0	
50		3	13	121	0	0	
50		4	19	121	0	0	
50		5	26	121	0	0	
100		1	2	121	0	0	
100		2	9	121	0	0	
100		3	18	121	0	0	
100		4	21	121	0	0	
100		5	29	121	0	0	

CETIS Summary Report

Report Date: 07 Nov-18 14:25 (p 1 of 1)
Test Code: 31248Ap-Comp6 | 04-3358-7078

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Batch ID:	01-8906-1095	Test Type:	Survival-Development				Analyst:	Nancy Roka			
Start Date:	25 Oct-18 17:35	Protocol:	EPA/600/R-95/136 (1995)				Diluent:	CLDS Reference Site			
Ending Date:	29 Oct-18 11:40	Species:	Arbacia punctulata				Brine:	Not Applicable			
Duration:	90h	Source:	ARO - Aquatic Research Organisms, NH				Age:				
Sample ID:	08-5165-6327	Code:	31246-111				Client:	AECOM			
Sample Date:	25 Oct-18 15:20	Material:	Elutriate Solution				Project:	Dredged Sediment Evaluation			
Receipt Date:	25 Oct-18 15:20	Source:	New Haven Harbor 2018								
Sample Age:	2h	Station:	Comp 6 Elutriate (CAD-1,-2,-3)								
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method			Level	%	95% LCL	95% UCL	TU	✓	
02-0765-8969	Proportion Normal	Binomial/Graphical			EC50	22.4	10	50	4.472	✓	
14-5699-9464	Proportion Normal	Binomial/Graphical			EC50	22.4	10	50	4.472	✓	
16-0154-7633	Proportion Normal	Linear Interpolation (ICPIN)			EC50	22.7	22.5	22.7	4.408		
17-9337-7122	Proportion Normal	Linear Interpolation (ICPIN)			EC50	22.7	22.7	22.7	4.408		
00-8284-4327	Proportion Survived	Binomial/Graphical			EC50	22.4	10	50	4.472	✓	
13-2255-0050	Proportion Survived	Linear Interpolation (ICPIN)			EC50	22.7	22.7	22.7	4.408		
Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.765	0.718	0.813	0.736	0.818	0.017	0.038	4.98%	0.00%
0	R	5	0.760	0.673	0.848	0.711	0.884	0.032	0.070	9.26%	0.65%
1		5	0.924	0.821	1.000	0.785	0.992	0.037	0.083	8.98%	-20.73%
10		5	0.899	0.839	0.959	0.835	0.959	0.022	0.048	5.38%	-17.49%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LS	5	0.779	0.737	0.820	0.744	0.818	0.015	0.034	4.34%	0.00%
0	R	5	0.780	0.673	0.887	0.702	0.926	0.039	0.086	11.07%	-0.21%
1		5	0.926	0.820	1.000	0.785	1.000	0.038	0.085	9.15%	-18.90%
10		5	0.907	0.840	0.974	0.835	0.975	0.024	0.054	5.95%	-16.56%
50		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
100		5	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.818	0.736	0.736	0.793	0.744					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.934	0.926	0.992	0.785	0.983					
10		0.835	0.959	0.884	0.934	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	LS	0.818	0.744	0.752	0.810	0.769					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.934	0.926	1.000	0.785	0.983					
10		0.835	0.975	0.901	0.942	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:25 (p 1 of 2)
Test Code: 31248Ap-Comp6 | 04-3358-7078

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 02-0765-8969		Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:13		Analysis: Binomial Method		Official Results: Yes							
Sample ID: 08-5165-6327		Code: 31246-111		Client: AECOM							
Sample Date: 25 Oct-18 15:20		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 15:20		Source: New Haven Harbor 2018									
Sample Age: 2h		Station: Comp 6 Elutriate (CAD-1,-2,-3)									
Binomial/Graphical Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.24	0.00%	1.35	0	22.4	10	50				
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.873	0.0%
1		4	0.959	0.926	0.992	0.034	3.52%	-26.1%	464/484	0.873	0.0%
10		5	0.899	0.835	0.959	0.048	5.38%	-18.3%	544/605	0.873	0.0%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.934	0.926	0.992	Outlier	0.983					
10		0.835	0.959	0.884	0.934	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:25 (p 2 of 2)
 Test Code: 31248Ap-Comp6 | 04-3358-7078

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 00-8284-4327		Endpoint: Proportion Survived		CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:13		Analysis: Binomial Method		Official Results: Yes							
Sample ID: 08-5165-6327		Code: 31246-111		Client: AECOM							
Sample Date: 25 Oct-18 15:20		Material: Elutriate Solution		Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 15:20		Source: New Haven Harbor 2018									
Sample Age: 2h		Station: Comp 6 Elutriate (CAD-1,-2,-3)									
Binomial/Graphical Estimates											
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL				
Control Threshold	0.22	0.00%	1.35	0	22.4	10	50				
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.62	2.82	0.1172	No Outliers Detected						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.871	0.0%
1		5	0.926	0.785	1.000	0.085	9.15%	-18.6%	560/605	0.871	0.0%
10		5	0.907	0.835	0.975	0.054	5.95%	-16.3%	549/605	0.871	0.0%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.934	0.926	1.000	0.785	0.983					
10		0.835	0.975	0.901	0.942	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:24 (p 1 of 2)
Test Code: 31248Ap-Comp6 | 04-3358-7078

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 16-0154-7633	Endpoint: Proportion Normal					CETIS Version: CETISv1.9.3					
Analyzed: 07 Nov-18 10:13	Analysis: Linear Interpolation (ICPIN)					Official Results: Yes					
Sample ID: 08-5165-6327	Code: 31246-111					Client: AECOM					
Sample Date: 25 Oct-18 15:20	Material: Elutriate Solution					Project: Dredged Sediment Evaluation					
Receipt Date: 25 Oct-18 15:20	Source: New Haven Harbor 2018										
Sample Age: 2h	Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	482849	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	22.7	22.5	22.7	4.408	4.408	4.443					
Proportion Normal Summary				Calculated Variate(A/B)				Isotonic Variate			
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.760	0.711	0.884	0.070	9.26%	0.0%	460/605	0.873	0.0%
1		4	0.959	0.926	0.992	0.034	3.52%	-26.1%	464/484	0.873	0.0%
10		5	0.899	0.835	0.959	0.048	5.38%	-18.3%	544/605	0.873	0.0%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.884	0.727	0.744	0.711	0.736					
1		0.934	0.926	0.992	Outlier	0.983					
10		0.835	0.959	0.884	0.934	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

CETIS Analytical Report

Report Date: 07 Nov-18 14:24 (p 2 of 2)
Test Code: 31248Ap-Comp6 | 04-3358-7078

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 13-2255-0050	Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 07 Nov-18 10:13	Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 08-5165-6327	Code: 31246-111			Client: AECOM							
Sample Date: 25 Oct-18 15:20	Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 25 Oct-18 15:20	Source: New Haven Harbor 2018										
Sample Age: 2h	Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	142351	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.62	2.82	0.1172	No Outliers Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	22.7	22.7	22.7	4.408	4.408	4.408					
Proportion Survived Summary											
			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	R	5	0.780	0.702	0.926	0.086	11.10%	0.0%	472/605	0.871	0.0%
1		5	0.926	0.785	1.000	0.085	9.15%	-18.6%	560/605	0.871	0.0%
10		5	0.907	0.835	0.975	0.054	5.95%	-16.3%	549/605	0.871	0.0%
50		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
100		5	0.000	0.000	0.000	0.000		100.0%	0/605	0	100.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	R	0.926	0.744	0.785	0.744	0.702					
1		0.934	0.926	1.000	0.785	0.983					
10		0.835	0.975	0.901	0.942	0.884					
50		0.000	0.000	0.000	0.000	0.000					
100		0.000	0.000	0.000	0.000	0.000					

Arbacia punctulata
Suspended Particulate Phase

Bench Sheets

Mitigated Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #: 312191 ^{12/13} ¹¹⁰² Incubator ID: 142 ¹¹⁰²
 Project: New Haven Harbor 2018 Client: AECOM

Composites 1, 2, 3, 4, 5 & 6

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>) <input checked="" type="checkbox"/> Sea Urchin (<i>Arbacia</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 2 ppt ^{② JTP} 2 12/27/18 pH: 7.8 ± 0.5	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C ^{② JTP} 20 ± 1 °C 12/27/18 Photoperiod: 16 hour light, 8 hour dark
--	---

Test Chamber	Solution Volume
(Check box for all that apply) <input checked="" type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input type="checkbox"/> other _____	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____

Replicate Information

<i>A. bahia</i> and <i>M. beryllina</i> : • 5 Reps per treatment • 10 organisms per chamber	<i>Arbacia</i> : • 5 Reps per treatment • 20-30 embryos/mL
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Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)

Feeding

<i>A. bahia</i> : Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i> : Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i> : NONE	

Date: 11/21/18

Initial BG



99ApAR0090618

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Arbacia punctulata

Source: Lab reared _____ Hatchery reared _____ Field collected

Hatch date mixed aged adults Receipt date 09/06/18

Lot number 090618AP Strain WILD

Brood origination N.C

II. Water Quality

Temperature 15 °C Salinity 30 ppt D.O. sat ppm

pH 8.3 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating _____ Flow through Static renewal _____

DIET: Flake food _____ ^{MACRO-}Phytoplankton _____ Trout chow _____

Artemia _____ Rotifers _____ YCT _____ Other _____

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: ESTI # of Organisms 30

Carrier: FEDEX/PICKUP Date shipped 9/6/18

Biologist: Stan Jinitshi

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31248 ^{9L} ^{12/13} ^{12/13}

CLIENT: AECOM

DILUENT: ^{JTP} ^{11/21/18} GLDS Lab Salt

SPECIES: *A. punctulata*

TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: 3		Composite #: 4	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1200	0	1200	0	1200	0	1200
	0	↓		↓	0	↓	0	↓
1 %	12	↓	12	↓	12	↓	12	↓
10 %	120	↓	120	↓	120	↓	120	↓
50 %	600	↓	600	↓	600	↓	600	↓
100 %	1,200	↓	1,200	↓	1,200	↓	1,200	↓
Initial	CFS		CFS		GRS		GRS	
Date	11/21/18		11/21/18		11/21/18		11/21/18	
Time	1130		1145		1255		1230	
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	19.1		19.0		18.1		18.6	
Vol of Elutriate (mL)	2,900 mL		2,840 mL		2,160 mL		2460 mL	
Grams of Salt (g)	36.4		36.0		29.6		28.0	
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity	29.2		28.4		29.1		29.6	
Date & Initial	11/21/18	CFS	11/21/18	CFS	11/21/18	CFS	11/21/18	GRS

PREPARATION of DILUTIONS

STUDY: 31248 ⁹¹ ^{12/13}

CLIENT: AECOM

DILUENT: ~~CTDS~~ ^{② JTP 11/21/18} Lab Salt

SPECIES: *A. punctulata*

TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 5		Composite #: 6			
Concentration	Elutriate ID:		Elutriate ID:			
	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)		
Lab	0	1200	0	1200		
	0		0			
1 %	12		12			
10 %	120		120			
50 %	600		600			
100 %	1,200		1,200			
Initial	GRS		CFS			
Date	11/21/18		11/21/18			
Time	1240		1240			
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)			
Initial Salinity (ppt)	18.4		18.0			
Vol of Elutriate (mL)	2200		2,500 mL			
Grams of Salt (g)	29.4		34.6			
Lot number of Salt	A-517		A-517			
Final Salinity	29.4		28.8			
Date & Initial	11/21/18	GRS	11/21/18	CFS		

EMBRYO WORKSHEET

DATE: 11/21/18 ESI STUDY: ^{91 @ 06 1213} 31246
 CLIENT: AECOM PROJECT: New Haven Harbor

Eggs Collected @: 1000 Pre-assay fertilization check: 92% ANALYST: GRS
 Sperm Collected @: 1000 *A mated subsample of egg+sperm must achieve ≥90% fertilization in order to be used in testing.*

Egg Stock Suspension Count:

Take 1mL of egg stock suspension and using a glass graduated cylinder dilute with seawater to a final volume of 100 mL. Count a subsample of the diluted suspension to get an estimate of the egg concentration. The diluted suspension should have 40 - 50 eggs/mL, (which would represent an egg concentration of 4,000 - 5,000 in the stock suspension.)

Egg Count (per mL) of diluted suspension: 4000

Sperm Stock Suspension Count:

1. Hemocytometer Count (E): <u>143</u> 2. Hemocytometer Count (E): <u>130</u> Average Count (E): <u>137</u> Sperm Concentrations:	<p style="text-align: center;"><i>Once added to the egg stock, the final sperm concentration should be $1 \times 10^5 - 1 \times 10^7$ in solution E.</i></p> $\text{X}10^4 = \text{spm solution E} = \frac{1.37 \times 10^6}{100} = 1.37 \times 10^4$ $\text{Solution B} = \frac{5.48 \times 10^7}{100} = 5.48 \times 10^5$ $\text{Solution C} = \frac{2.74 \times 10^7}{100} = 2.74 \times 10^5$ $\text{Solution D} = \frac{6.85 \times 10^6}{100} = 6.85 \times 10^4$ <p style="text-align: right;">Sperm Count (per mL): <u>1.37×10^6</u></p>
--	--

mL of Eggs to Add: 200
 mL of Sperm to Add: 30 Gametes mixed @: 1040
Gametes must be mixed within 1 hour of collection.

Calculated Embryo Stock Concentration (per mL): ^{34.80} 3480 *The test concentration should be 20 - 30 embryos per mL.*
 Calculated Embryo Stock (mL) needed per chamber: 1.42

Add calculated amount of embryo stock to a surrogate chamber, gently mix, then count a 5mL aliquot.

Embryo Concentration Check: 105 *If the check concentration is acceptable, then proceed with embryo addition to the test.*

Volume Embryo Stock (mL) added to test solutions: 1.5 mL Embryos Added to Test Solutions @: 1310

INITIAL COUNTS:

SURROGATE	Embryos/ 5 mL
SURROGATE A	<u>105</u>
SURROGATE B	<u>101</u>
SURROGATE C	<u>109</u>
Mean:	<u>21</u> 105

Organism Lot ID: 99APAR00910618
 Mean per mL: 21

(3) GRS 11/21

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 ⁹¹ ^{12/13}

Client: AECOM

Project: New Haven Harbor

Test Species: *A. punctulata*

Lot ID: 99APAR0090618

Diluent: CLDS Lab Salt

(E3) NR 12/20/18

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 12 hr	0 hr	END 12 hr	0 hr	END 12 hr	0 hr	END 12 hr	START	END
Controls	Lab	7.8	7.5	7.91	8.00	19	20	31	33	330	355
	CLDS							^{(E3) MW 1121} 30			
Composite #1	1 %	7.6	7.5	7.91	8.02	20	21	32	33		
	10 %	7.5	7.5	7.89	8.04	20	21	32	33		
	50 %	7.4	7.5	7.87	8.05	20	21	31	33		
	100 %	7.4	7.2	7.79	8.04	20	21	30	31	331-334	356-359
Composite #2	1 %	7.5	7.5	7.92	8.07	20	21	32	33		
	10 %	7.5	7.5	7.95	8.08	20	21	32	33		
	50 %	7.5	7.5	7.89	8.10	20	21	32	33		
	100 %	7.0	7.4	7.72	8.13	19	21	30	32	335-338	362-365
Initials		MW	MW	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		11/21/18	11/24/18	Exposure				DO Meter #	MLOZ	DO Meter #	
Time		1205	1140		0	^{(E3) MW 1121} 24 7Z	DO Probe #	160	DO Probe #		
Incub. Temp		20	20	Water Quality Station #	1	1	pH Meter #	MLOZ	pH Meter #		
Comments:				Thermometer or Probe #	MLOZ	MLOZ	pH Probe #	163	pH Probe #		
				Initial	MW	MW	Salinity Meter	MLOZ	Salinity Meter		

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 312491
312491
 10/24/18
 11/13

Client: AECOM

Project: New Haven Harbor

Test Species: *A. punctulata*

Lot ID: 99AFAR0090618

Diluent: ~~GLDS~~ Lab salt

11/2/2018 (MR)

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	START	END
Controls	Lab	/		/		/		/		/	
	CLDS	/		/		/		/		/	
Composite #3	1 %	7.5	7.5	7.99	8.07	20	20	32	33		
	10 %	7.5	7.6	7.98	8.09	20	20	32	34		
	50 %	7.4	7.5	8.00	8.10	20	20	31	33		
	100 %	6.8	7.4	8.01	8.11	20	20	30	31	53-542 339-342 11/2/18	54-57 361-367 366-369 11/2/18
Composite #4	1 %	7.6	7.4	7.95	8.09	20	20	31	34		
	10 %	7.5	7.5	7.97	8.09	20	20	31	34		
	50 %	7.5	7.5	7.99	8.10	20	20	31	33	813-546	368-371 11/2/18
	100 %	6.7	7.5	8.01	8.15	20	20	30	32	345-346 11/2/18	372-375 11/2/18
Initials		MW	MW	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		11/21/18	11/24/18	Exposure				DO Meter #	MLOZ	DO Meter #	/
Time		1235	1155	0				DO Probe #	160	DO Probe #	/
Incub. Temp		20	20	Water Quality Station #	1	1	pH Meter #	MLOZ	pH Meter #	/	
Comments:				Thermometer or Probe #	MLOZ	MLOZ	pH Probe #	163	pH Probe #	/	
				Initial	MW	MW	Salinity Meter	MLOZ	Salinity Meter	/	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 ⁹¹ _{11/13}

Client: AECOM

Project: New Haven Harbor

Test Species: *A. punctulata*

Lot ID: 99AFA ⁰⁹⁰⁶¹⁸ _{11/13}

Diluent: GLDS Lab Salt

Ⓢ NR 12/2018

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 12 hr	0 hr	END 12 hr	0 hr	END 12 hr	0 hr	END 12 hr	START	END
Controls	Lab	/		/		/		/		/	
	CLDS	/		/		/		/		/	
Composite #5	1 %	7.6	7.5	7.93	7.99	20	20	31	32		
	10 %	7.5	7.5	7.93	8.07	20	20	32	33		
	50 %	7.4	7.3	7.85	8.11	20	20	32	33		
	100 %	6.4	7.0	7.74	8.14	20	20	32	32	517-550 347-350	26RS/127 378-379 378-379
Composite #6	1 %	7.5	7.5	7.91	8.09	20	20	32	33		
	10 %	7.5	7.5	7.98	8.09	20	20	32	33		
	50 %	7.3	7.4	7.93	8.10	20	20	31	32		
	100 %	7.6	7.4	7.88	8.12	20	21	30	30	551-554 351-354	576-574 376-379 300-383
Initials		MW	MW	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		11/21/18	11/24/18	Exposure				DO Meter #	MLOZ	DO Meter #	/
Time		1140	1210	0 ^{GLDS} 24 72 11/27				DO Probe #	160	DO Probe #	/
Incub. Temp		20	20	Water Quality Station #		1	1	pH Meter #	MLOZ	pH Meter #	/
Comments:		Thermometer or Probe #		MLOZ	MLOZ	pH Probe #		163	pH Probe #	/	/
		Initial		MW	MW	Salinity Meter		MLOZ	Salinity Meter	/	/

Arbacia Punctulata Survival / Development Assay

ESI Study: 3R48⁹¹ @ 04/12/13

Assay Start: 11/21/18 1310

Client: AECOM

Assay End: 0905³ CFS 11/24

Count Date: 11/24/18

Initials: CFS

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Lab Control Water	92/90	74/72	80/78	87/86	64/63
CLDS Reference Water	—	—	—	—	—
Composite 1 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	80/78	89/86	88/86	66/64	100/98
10%	86/84	70/62	70/60	^{CFS} 80/73	^{CFS} 68/69
50%	77/70	71/64	72/65	^{11/24} 66/59	72/63
100%	96/84	85/76	79/70	74/67	63/57
Composite 2 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	83/80	80/76	90/86	83/80	88/86
10%	84/80	79/74	79/72	93/85	77/70
50%	89/82	72/59	75/62	77/66	89/73
100%	67/46	75/41	79/53	75/48	69/50
Composite 3 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	112/108	84/80	89/86	79/77	90/87
10%	96/94	80/77	81/78	82/75	85/80
50%	66/62	87/81	89/83	95/84	83/78
100%	70/61	78/69	69/63	74/68	72/65

Arbacia Punctulata Survival / Development Assay

ESI Study: 31246^{9/16⁰⁶ 12/13} Assay Start: 11/21/18 1310
 Client: AECOM Assay End: 0905³ 11/24^{CFS}
 Count Date: 11/24/18 - Initials: CFS

Composite 4 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	92/87	99/95	92/90	89/86	83/80
10%	77 99/95 ⁷² <small>CFS 11/24</small>	81/75	86/81	82 ³ /77 <small>CFS 11/24</small>	78/73
50%	74/66	76/68	80/70	74/67	71/62
100%	69/37	163/91 ⁽⁶¹⁰⁾ <small>11/27</small>	78/46	63/36	74/41
Composite 5 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	73/69	77/76	85/83	79/78	74/70
10%	74/71	94/90	84/81	81/76	99/94
50%	84/76	80/69	92/87	78/70	89/82
100%	75/64	82/68	85/70	84/73	72/59
Composite 6 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%	76/74	78/77	85/83	80/77	71/70
10%	68/66	72/69	66/62	54/49	76/69
50%	85/78	60/57	70/64	81/74	71/66
100%	75/68	89/82	86/77	86/79	89/79

(610) GRS 11/27 Test replicate added to twice.

Assay Review Checklist

DATE IN: 11/21/18 STUDY#: 31248⁹¹ 31248¹²¹¹
 DATE DUE: _____ CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: AP96AD

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	11/21/18	GRS	Start
Day 1	11/22/18	CFS	Obs
Day 2	11/23/18	CFS	Obs
Day 3	11/24/18	CFS	End/Cts
Day 4	11/25/18	-	Cts -
Day 5	11/26/18	-	-
Day 6	11/27/18	CFS	Cts
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	11/16/18	JTP	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)	11/27/18	GRS	
Bench Sheets Complete (dates, times, initials, etc...)	↓	↓	
Water Quality Data Complete	↓	↓	
TRC Values & Bottle Numbers	↓	↓	
Daphnid Calculations Complete	NA	NA	
Weights Reported	↓	↓	
Assay Acceptability Review	11/27/18	GRS	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	11/28/18	NRC	
Statistical Analysis Reviewed	11/29/18	LP	
Data Acceptability Review	11/29/18	NRC	
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

P:\GENERAL PROJECTS\FORMS\LAB\FORMS\ Assay Review Checklist.wpd

Arbacia punctulata
Suspended Particulate Phase
Statistical Analysis Reports
Survival and Development
Mitigated Assays

CETIS Test Data Worksheet

Report Date: 28 Nov-18 11:17 (p 1 of 1)
Test Code/ID: 19-3186-2767/31291Ap-Comp1

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-118		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 09:00	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V',W')		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	5	105	92	90	
0	L	2	6	105	74	72	
0	L	3	14	105	80	78	
0	L	4	17	105	87	86	
0	L	5	25	105	64	63	
1		1	1	105	80	78	
1		2	9	105	89	86	
1		3	15	105	88	86	
1		4	18	105	66	64	
1		5	24	105	100	98	
10		1	4	105	86	84	
10		2	8	105	70	62	
10		3	12	105	70	60	
10		4	16	105	80	73	
10		5	21	105	78	69	
50		1	2	105	77	70	
50		2	10	105	71	64	
50		3	13	105	72	65	
50		4	19	105	66	59	
50		5	22	105	72	63	
100		1	3	105	96	84	
100		2	7	105	85	76	
100		3	11	105	79	70	
100		4	20	105	74	67	
100		5	23	105	63	57	

CETIS Summary Report

Report Date: 29 Nov-18 10:43 (p 1 of 1)
Test Code: 31291Ap-Comp1 | 19-3186-2767

Echinoid Embryo-Larval Survival and Development Test **EnviroSystems, Inc.**

Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 13-2445-7334	Code: 31246-118	Client: AECOM
Sample Date: 21 Nov-18 09:00	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 09:00	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 1 Elutriate (V,W')	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
11-8946-8126	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
13-2835-2713	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.785	0.637	0.933	0.610	0.933	0.053	0.119	15.20%	-5.91%
10		5	0.663	0.549	0.776	0.571	0.800	0.041	0.092	13.80%	10.54%
50		5	0.611	0.565	0.658	0.562	0.667	0.017	0.038	6.17%	17.48%
100		5	0.674	0.555	0.794	0.543	0.800	0.043	0.096	14.24%	9.00%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.806	0.657	0.955	0.629	0.952	0.054	0.120	14.90%	-6.55%
10		5	0.731	0.650	0.813	0.667	0.819	0.029	0.065	8.95%	3.27%
50		5	0.682	0.636	0.728	0.629	0.733	0.017	0.037	5.46%	9.82%
100		5	0.756	0.611	0.902	0.600	0.914	0.052	0.117	15.49%	0.00%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.743	0.819	0.819	0.610	0.933	
10		0.800	0.590	0.571	0.695	0.657	
50		0.667	0.610	0.619	0.562	0.600	
100		0.800	0.724	0.667	0.638	0.543	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		0.762	0.848	0.838	0.629	0.952	
10		0.819	0.667	0.667	0.762	0.743	
50		0.733	0.676	0.686	0.629	0.686	
100		0.914	0.810	0.752	0.705	0.600	

CETIS Analytical Report

Report Date: 29 Nov-18 10:42 (p 1 of 2)
Test Code: 31291Ap-Comp1 | 19-3186-2767

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 11-8946-8126		Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:42		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 13-2445-7334		Code: 31246-118			Client: AECOM							
Sample Date: 21 Nov-18 09:00		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 09:00		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	183666	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.09	2.82	0.7317	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.763	0.0%	
1		5	0.785	0.610	0.933	0.119	15.20%	-5.91%	412/525	0.763	0.0%	
10		5	0.663	0.571	0.800	0.092	13.80%	10.5%	348/525	0.663	13.1%	
50		5	0.611	0.562	0.667	0.038	6.17%	17.5%	321/525	0.643	15.7%	
100		5	0.674	0.543	0.800	0.096	14.20%	9.0%	354/525	0.643	15.7%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.857	0.686	0.743	0.819	0.600						
1		0.743	0.819	0.819	0.610	0.933						
10		0.800	0.590	0.571	0.695	0.657						
50		0.667	0.610	0.619	0.562	0.600						
100		0.800	0.724	0.667	0.638	0.543						

CETIS Analytical Report

Report Date: 29 Nov-18 10:42 (p 2 of 2)
Test Code: 31291Ap-Comp1 | 19-3186-2767

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 13-2835-2713		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:42		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 13-2445-7334		Code: 31246-118			Client: AECOM							
Sample Date: 21 Nov-18 09:00		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 09:00		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 1 Elutriate (V,W')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1923830	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.06	2.82	0.8177	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.781	0.0%	
1		5	0.806	0.629	0.952	0.120	14.90%	-6.55%	423/525	0.781	0.0%	
10		5	0.731	0.667	0.819	0.065	8.95%	3.27%	384/525	0.731	6.34%	
50		5	0.682	0.629	0.733	0.037	5.46%	9.82%	358/525	0.719	7.93%	
100		5	0.756	0.600	0.914	0.117	15.50%	0.0%	397/525	0.719	7.93%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.876	0.705	0.762	0.829	0.610						
1		0.762	0.848	0.838	0.629	0.952						
10		0.819	0.667	0.667	0.762	0.743						
50		0.733	0.676	0.686	0.629	0.686						
100		0.914	0.810	0.752	0.705	0.600						

CETIS Test Data Worksheet

Report Date: 28 Nov-18 11:22 (p 1 of 1)
Test Code/ID: 09-0904-7811/31291Ap-Comp2

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-119		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 09:00	Material:	Elutriate Solution	Sample Station:	Comp 2 Elutriate (R',S')		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	1	105	92	90	
0	L	2	7	105	74	72	
0	L	3	13	105	80	78	
0	L	4	18	105	87	86	
0	L	5	25	105	64	63	
1		1	5	105	83	80	
1		2	8	105	80	76	
1		3	15	105	90	86	
1		4	20	105	83	80	
1		5	22	105	88	86	
10		1	4	105	84	80	
10		2	10	105	79	74	
10		3	12	105	79	72	
10		4	16	105	93	85	
10		5	21	105	77	70	
50		1	3	105	89	82	
50		2	9	105	72	59	
50		3	14	105	75	62	
50		4	17	105	77	66	
50		5	24	105	89	73	
100		1	2	105	67	46	
100		2	6	105	75	41	
100		3	11	105	79	53	
100		4	19	105	75	48	
100		5	23	105	69	50	

CETIS Summary Report

Report Date: 29 Nov-18 10:47 (p 1 of 1)
 Test Code: 31291Ap-Comp2 | 09-0904-7811

Echinoid Embryo-Larval Survival and Development Test	EnviroSystems, Inc.
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Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 06-6889-0463	Code: 31246-119	Client: AECOM
Sample Date: 21 Nov-18 09:00	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 09:00	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 2 Elutriate (R',S')	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
13-9756-8643	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
08-4953-6377	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.777	0.726	0.828	0.724	0.819	0.019	0.041	5.31%	-4.88%
10		5	0.726	0.653	0.799	0.667	0.810	0.026	0.059	8.11%	2.06%
50		5	0.651	0.542	0.761	0.562	0.781	0.039	0.088	13.50%	12.08%
100		5	0.453	0.400	0.507	0.390	0.505	0.019	0.043	9.47%	38.82%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.808	0.759	0.856	0.762	0.857	0.017	0.039	4.82%	-6.80%
10		5	0.785	0.708	0.861	0.733	0.886	0.028	0.062	7.85%	-3.78%
50		5	0.766	0.671	0.861	0.686	0.848	0.034	0.077	10.01%	-1.26%
100		5	0.695	0.637	0.753	0.638	0.752	0.021	0.047	6.71%	8.06%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.762	0.724	0.819	0.762	0.819	
10		0.762	0.705	0.686	0.810	0.667	
50		0.781	0.562	0.590	0.629	0.695	
100		0.438	0.390	0.505	0.457	0.476	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		0.790	0.762	0.857	0.790	0.838	
10		0.800	0.752	0.752	0.886	0.733	
50		0.848	0.686	0.714	0.733	0.848	
100		0.638	0.714	0.752	0.714	0.657	

CETIS Analytical Report

Report Date: 29 Nov-18 10:47 (p 1 of 2)
Test Code: 31291Ap-Comp2 | 09-0904-7811

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 13-9756-8643		Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3								
Analyzed: 29 Nov-18 10:45		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Sample ID: 06-6889-0463		Code: 31246-119		Client: AECOM								
Sample Date: 21 Nov-18 09:00		Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 21 Nov-18 09:00		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1337927	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.15	2.82	0.6228	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.759	0.0%	
1		5	0.777	0.724	0.819	0.041	5.31%	-4.88%	408/525	0.759	0.0%	
10		5	0.726	0.667	0.810	0.059	8.11%	2.06%	381/525	0.726	4.39%	
50		5	0.651	0.562	0.781	0.088	13.50%	12.1%	342/525	0.651	14.2%	
100		5	0.453	0.390	0.505	0.043	9.47%	38.8%	238/525	0.453	40.3%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.857	0.686	0.743	0.819	0.600						
1		0.762	0.724	0.819	0.762	0.819						
10		0.762	0.705	0.686	0.810	0.667						
50		0.781	0.562	0.590	0.629	0.695						
100		0.438	0.390	0.505	0.457	0.476						

CETIS Analytical Report

Report Date: 29 Nov-18 10:47 (p 2 of 2)
Test Code: 31291Ap-Comp2 | 09-0904-7811

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 08-4953-6377		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:45		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 06-6889-0463		Code: 31246-119			Client: AECOM							
Sample Date: 21 Nov-18 09:00		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 09:00		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 2 Elutriate (R',S')										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1438000	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.16	2.82	0.6006	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.783	0.0%	
1		5	0.808	0.762	0.857	0.039	4.82%	-6.8%	424/525	0.783	0.0%	
10		5	0.785	0.733	0.886	0.062	7.85%	-3.78%	412/525	0.783	0.0%	
50		5	0.766	0.686	0.848	0.077	10.00%	-1.26%	402/525	0.766	2.19%	
100		5	0.695	0.638	0.752	0.047	6.71%	8.06%	365/525	0.695	11.2%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.876	0.705	0.762	0.829	0.610						
1		0.790	0.762	0.857	0.790	0.838						
10		0.800	0.752	0.752	0.886	0.733						
50		0.848	0.686	0.714	0.733	0.848						
100		0.638	0.714	0.752	0.714	0.657						

CETIS Test Data Worksheet

Report Date: 28 Nov-18 11:24 (p 1 of 1)
Test Code/ID: 05-9153-3709/31191Ap-Comp3

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-120		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 09:39	Material:	Elutriate Solution	Sample Station:	Comp 3 Elutriate (US-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	5	105	92	90	
0	L	2	7	105	74	72	
0	L	3	15	105	80	78	
0	L	4	18	105	87	86	
0	L	5	22	105	64	63	
1		1	4	112	112	108	
1		2	10	105	84	80	
1		3	13	105	89	86	
1		4	20	105	79	77	
1		5	23	105	90	87	
10		1	3	105	96	94	
10		2	8	105	80	77	
10		3	14	105	81	78	
10		4	16	105	82	75	
10		5	24	105	85	80	
50		1	1	105	66	62	
50		2	9	105	87	81	
50		3	11	105	89	83	
50		4	19	105	95	84	
50		5	25	105	83	78	
100		1	2	105	70	61	
100		2	6	105	78	69	
100		3	12	105	69	63	
100		4	17	105	74	68	
100		5	21	105	72	65	

CETIS Summary Report

Report Date: 29 Nov-18 10:49 (p 1 of 1)
 Test Code: 31191Ap-Comp3 | 05-9153-3709

Echinoid Embryo-Larval Survival and Development Test	EnviroSystems, Inc.
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Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 14-8384-9999	Code: 31246-120	Client: AECOM
Sample Date: 21 Nov-18 09:39	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 09:39	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 3 Elutriate (US-1,-2)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
18-5118-7170	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
03-5573-7296	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
11-9407-5239	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.821	0.711	0.932	0.733	0.964	0.040	0.089	10.85%	-10.86%
10		5	0.770	0.680	0.859	0.714	0.895	0.032	0.072	9.40%	-3.86%
50		5	0.739	0.632	0.846	0.590	0.800	0.038	0.086	11.62%	0.26%
100		5	0.621	0.581	0.661	0.581	0.657	0.014	0.032	5.13%	16.20%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.851	0.736	0.967	0.752	1.000	0.042	0.093	10.92%	-12.59%
10		5	0.808	0.730	0.885	0.762	0.914	0.028	0.062	7.71%	-6.80%
50		5	0.800	0.670	0.930	0.629	0.905	0.047	0.104	13.04%	-5.79%
100		5	0.691	0.649	0.734	0.657	0.743	0.015	0.034	4.93%	8.56%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.964	0.762	0.819	0.733	0.829	
10		0.895	0.733	0.743	0.714	0.762	
50		0.590	0.771	0.790	0.800	0.743	
100		0.581	0.657	0.600	0.648	0.619	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		1.000	0.800	0.848	0.752	0.857	
10		0.914	0.762	0.771	0.781	0.810	
50		0.629	0.829	0.848	0.905	0.790	
100		0.667	0.743	0.657	0.705	0.686	

CETIS Analytical Report

Report Date: 29 Nov-18 10:48 (p 1 of 2)
Test Code: 31191Ap-Comp3 | 05-9153-3709

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 18-5118-7170		Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:48		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 14-8384-9999		Code: 31246-120			Client: AECOM							
Sample Date: 21 Nov-18 09:39		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 09:39		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 3 Elutriate (US-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1583558	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.48	2.82	0.2013	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.781	0.0%	
1		5	0.821	0.733	0.964	0.089	10.80%	-10.9%	438/532	0.781	0.0%	
10		5	0.770	0.714	0.895	0.072	9.40%	-3.86%	404/525	0.77	1.49%	
50		5	0.739	0.590	0.800	0.086	11.60%	0.26%	388/525	0.739	5.39%	
100		5	0.621	0.581	0.657	0.032	5.13%	16.2%	326/525	0.621	20.5%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.857	0.686	0.743	0.819	0.600						
1		0.964	0.762	0.819	0.733	0.829						
10		0.895	0.733	0.743	0.714	0.762						
50		0.590	0.771	0.790	0.800	0.743						
100		0.581	0.657	0.600	0.648	0.619						

CETIS Analytical Report

Report Date: 29 Nov-18 10:48 (p 2 of 2)
Test Code: 31191Ap-Comp3 | 05-9153-3709

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.	
Analysis ID: 03-5573-7296		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 29 Nov-18 10:48		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes						
Sample ID: 14-8384-9999		Code: 31246-120			Client: AECOM						
Sample Date: 21 Nov-18 09:39		Material: Elutriate Solution			Project: Dredged Sediment Evaluation						
Receipt Date: 21 Nov-18 09:39		Source: New Haven Harbor 2018									
Sample Age: 4h		Station: Comp 3 Elutriate (US-1,-2)									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1487057	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.795	0.0%
1		4	0.814	0.752	0.857	0.048	5.93%	-7.68%	342/420	0.795	0.0%
10		5	0.808	0.762	0.914	0.062	7.71%	-6.8%	424/525	0.795	0.0%
50		5	0.800	0.629	0.905	0.104	13.00%	-5.79%	420/525	0.795	0.0%
100		5	0.691	0.657	0.743	0.034	4.93%	8.56%	363/525	0.691	13.0%
Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	L	0.876	0.705	0.762	0.829	0.610					
1		Outlier	0.800	0.848	0.752	0.857					
10		0.914	0.762	0.771	0.781	0.810					
50		0.629	0.829	0.848	0.905	0.790					
100		0.667	0.743	0.657	0.705	0.686					

CETIS Test Data Worksheet

Report Date: 28 Nov-18 11:26 (p 1 of 1)
Test Code/ID: 10-7275-5478/31191Ap-Comp4

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-121		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 09:39	Material:	Elutriate Solution	Sample Station:	Comp 4 Elutriate (DS-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	4	105	92	90	
0	L	2	7	105	74	72	
0	L	3	14	105	80	78	
0	L	4	19	105	87	86	
0	L	5	24	105	64	63	
1		1	5	105	92	87	
1		2	9	105	99	95	
1		3	15	105	92	90	
1		4	20	105	89	86	
1		5	21	105	83	80	
10		1	2	105	77	72	
10		2	8	105	81	75	
10		3	12	105	86	81	
10		4	16	105	83	77	
10		5	23	105	78	73	
50		1	3	105	74	66	
50		2	10	105	76	68	
50		3	13	105	80	70	
50		4	18	105	74	67	
50		5	25	105	71	62	
100		1	1	105	69	37	
100		2	6	163	163	91	
100		3	11	105	78	46	
100		4	17	105	63	36	
100		5	22	105	74	41	

CETIS Summary Report

Report Date: 29 Nov-18 10:50 (p 1 of 1)
 Test Code: 31191Ap-Comp4 | 10-7275-5478

Echinoid Embryo-Larval Survival and Development Test	EnviroSystems, Inc.
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Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 04-8504-2808	Code: 31246-121	Client: AECOM
Sample Date: 21 Nov-18 09:39	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 09:39	Source: New Haven Harbor 2018	
Sample Age: 4h	Station: Comp 4 Elutriate (DS-1,-2)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
01-7934-0258	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
10-1038-6604	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
14-9609-1099	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.834	0.769	0.899	0.762	0.905	0.023	0.052	6.28%	-12.60%
10		5	0.720	0.678	0.762	0.686	0.771	0.015	0.034	4.73%	2.83%
50		5	0.634	0.599	0.669	0.590	0.667	0.013	0.028	4.45%	14.40%
100		5	0.416	0.307	0.525	0.343	0.558	0.039	0.088	21.07%	43.80%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.867	0.798	0.935	0.790	0.943	0.025	0.055	6.36%	-14.61%
10		5	0.771	0.728	0.815	0.733	0.819	0.016	0.035	4.54%	-2.02%
50		5	0.714	0.675	0.754	0.676	0.762	0.014	0.032	4.42%	5.54%
100		5	0.741	0.549	0.933	0.600	1.000	0.069	0.154	20.83%	2.02%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.829	0.905	0.857	0.819	0.762	
10		0.686	0.714	0.771	0.733	0.695	
50		0.629	0.648	0.667	0.638	0.590	
100		0.352	0.558	0.438	0.343	0.390	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		0.876	0.943	0.876	0.848	0.790	
10		0.733	0.771	0.819	0.790	0.743	
50		0.705	0.724	0.762	0.705	0.676	
100		0.657	1.000	0.743	0.600	0.705	

CETIS Analytical Report

Report Date: 29 Nov-18 10:50 (p 1 of 3)
Test Code: 31191Ap-Comp4 | 10-7275-5478

Echinoid Embryo-Larval Survival and Development Test						EnviroSystems, Inc.					
Analysis ID: 01-7934-0258	Endpoint: Proportion Normal		CETIS Version: CETISv1.9.3								
Analyzed: 29 Nov-18 10:50	Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Sample ID: 04-8504-2808	Code: 31246-121		Client: AECOM								
Sample Date: 21 Nov-18 09:39	Material: Elutriate Solution		Project: Dredged Sediment Evaluation								
Receipt Date: 21 Nov-18 09:39	Source: New Haven Harbor 2018										
Sample Age: 4h	Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1197130	200	Yes	Two-Point Interpolation						
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.24	2.82	0.4723	No Outliers Detected						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC50	>100	n/a	n/a	<1	n/a	n/a					
Proportion Normal Summary			Calculated Variate(A/B)					Isotonic Variate			
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.788	0.0%
1		5	0.834	0.762	0.905	0.052	6.28%	-12.6%	438/525	0.788	0.0%
10		5	0.720	0.686	0.771	0.034	4.73%	2.83%	378/525	0.72	8.59%
50		5	0.634	0.590	0.667	0.028	4.45%	14.4%	333/525	0.634	19.5%
100		5	0.416	0.343	0.558	0.088	21.10%	43.8%	251/583	0.416	47.1%
Proportion Normal Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	L	0.857	0.686	0.743	0.819	0.600					
1		0.829	0.905	0.857	0.819	0.762					
10		0.686	0.714	0.771	0.733	0.695					
50		0.629	0.648	0.667	0.638	0.590					
100		0.352	0.558	0.438	0.343	0.390					

CETIS Analytical Report

Report Date: 29 Nov-18 10:50 (p 2 of 3)
Test Code: 31191Ap-Comp4 | 10-7275-5478

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 10-1038-6604		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:50		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-8504-2808		Code: 31246-121			Client: AECOM							
Sample Date: 21 Nov-18 09:39		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 09:39		Source: New Haven Harbor 2018										
Sample Age: 4h		Station: Comp 4 Elutriate (DS-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1376295	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	3.64	2.82	2.8E-04	Outlier Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.811	0.0%	
1		5	0.867	0.790	0.943	0.055	6.36%	-14.6%	455/525	0.811	0.0%	
10		5	0.771	0.733	0.819	0.035	4.54%	-2.02%	405/525	0.771	4.93%	
50		5	0.714	0.676	0.762	0.032	4.42%	5.54%	375/525	0.728	10.3%	
100		5	0.741	0.600	1.000	0.154	20.80%	2.02%	447/583	0.728	10.3%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.876	0.705	0.762	0.829	0.610						
1		0.876	0.943	0.876	0.848	0.790						
10		0.733	0.771	0.819	0.790	0.743						
50		0.705	0.724	0.762	0.705	0.676						
100		0.657	1.000	0.743	0.600	0.705						

CETIS Analytical Report

Report Date: 29 Nov-18 10:50 (p 3 of 3)
Test Code: 31191Ap-Comp4 | 10-7275-5478

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.			
Analysis ID: 14-9609-1099	Endpoint: Proportion Survived									CETIS Version: CETISv1.9.3			
Analyzed: 29 Nov-18 10:50	Analysis: Linear Interpolation (ICPIN)									Official Results: Yes			
Sample ID: 04-8504-2808	Code: 31246-121									Client: AECOM			
Sample Date: 21 Nov-18 09:39	Material: Elutriate Solution									Project: Dredged Sediment Evaluation			
Receipt Date: 21 Nov-18 09:39	Source: New Haven Harbor 2018												
Sample Age: 4h	Station: Comp 4 Elutriate (DS-1,-2)												
Linear Interpolation Options													
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method								
Log(X+1)	Linear	1172322	200	Yes	Two-Point Interpolation								
Point Estimates													
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL							
EC50	>100	n/a	n/a	<1	n/a	n/a							
Proportion Survived Summary				Calculated Variate(A/B)						Isotonic Variate			
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect		
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.811	0.0%		
1		5	0.867	0.790	0.943	0.055	6.36%	-14.6%	455/525	0.811	0.0%		
10		5	0.771	0.733	0.819	0.035	4.54%	-2.02%	405/525	0.771	4.93%		
50		5	0.714	0.676	0.762	0.032	4.42%	5.54%	375/525	0.714	12.0%		
100		4	0.676	0.600	0.743	0.062	9.13%	10.6%	284/420	0.676	16.7%		
Proportion Survived Detail													
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5							
0	L	0.876	0.705	0.762	0.829	0.610							
1		0.876	0.943	0.876	0.848	0.790							
10		0.733	0.771	0.819	0.790	0.743							
50		0.705	0.724	0.762	0.705	0.676							
100		0.657	Outlier	0.743	0.600	0.705							

CETIS Test Data Worksheet

Report Date: 19 Dec-18 12:33 (p 1 of 1)
Test Code/ID: 10-8867-6865/31191Ap-Comp5

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-122		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 10:30	Material:	Elutriate Solution	Sample Station:	Comp 5 Elutriate (TB-1,-2)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	5	105	92	90	
0	L	2	6	105	74	72	
0	L	3	13	105	80	78	
0	L	4	20	105	87	86	
0	L	5	22	105	64	63	
1		1	3	105	73	69	
1		2	7	105	77	76	
1		3	14	105	85	83	
1		4	17	105	79	78	
1		5	21	105	74	70	
10		1	1	105	74	71	
10		2	9	105	94	90	
10		3	11	105	84	81	
10		4	16	105	81	76	
10		5	25	105	99	94	
50		1	2	105	84	76	
50		2	8	105	80	69	
50		3	15	105	92	87	
50		4	18	105	78	70	
50		5	24	105	89	82	
100		1	4	105	75	64	
100		2	10	105	82	68	
100		3	12	105	85	70	
100		4	19	105	84	73	
100		5	23	105	72	59	

CETIS Summary Report

Report Date: 29 Nov-18 10:52 (p 1 of 1)
Test Code: 31191Ap-Comp5 | 10-8867-6865

Echinoid Embryo-Larval Survival and Development Test **EnviroSystems, Inc.**

Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 04-7993-6295	Code: 31246-122	Client: AECOM
Sample Date: 21 Nov-18 10:30	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 10:30	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 5 Elutriate (TB-1,-2)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
12-9348-4704	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
00-0356-4508	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.716	0.648	0.785	0.657	0.790	0.025	0.055	7.72%	3.34%
10		5	0.785	0.672	0.898	0.676	0.895	0.041	0.091	11.60%	-5.91%
50		5	0.731	0.640	0.823	0.657	0.829	0.033	0.074	10.06%	1.29%
100		5	0.636	0.572	0.701	0.562	0.695	0.023	0.052	8.16%	14.14%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.739	0.683	0.796	0.695	0.810	0.020	0.046	6.15%	2.27%
10		5	0.823	0.704	0.942	0.705	0.943	0.043	0.096	11.65%	-8.82%
50		5	0.806	0.736	0.875	0.743	0.876	0.025	0.056	6.97%	-6.55%
100		5	0.758	0.690	0.826	0.686	0.810	0.025	0.055	7.25%	-0.25%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.657	0.724	0.790	0.743	0.667	
10		0.676	0.857	0.771	0.724	0.895	
50		0.724	0.657	0.829	0.667	0.781	
100		0.610	0.648	0.667	0.695	0.562	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		0.695	0.733	0.810	0.752	0.705	
10		0.705	0.895	0.800	0.771	0.943	
50		0.800	0.762	0.876	0.743	0.848	
100		0.714	0.781	0.810	0.800	0.686	

CETIS Analytical Report

Report Date: 29 Nov-18 10:52 (p 1 of 2)
Test Code: 31191Ap-Comp5 | 10-8867-6865

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 12-9348-4704		Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:51		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7993-6295		Code: 31246-122			Client: AECOM							
Sample Date: 21 Nov-18 10:30		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 10:30		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 5 Elutriate (TB-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	1680358	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	1.89	2.82	1.0000	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Normal Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.747	0.0%	
1		5	0.716	0.657	0.790	0.055	7.72%	3.34%	376/525	0.747	0.0%	
10		5	0.785	0.676	0.895	0.091	11.60%	-5.91%	412/525	0.747	0.0%	
50		5	0.731	0.657	0.829	0.074	10.10%	1.29%	384/525	0.731	2.12%	
100		5	0.636	0.562	0.695	0.052	8.16%	14.1%	334/525	0.636	14.9%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.857	0.686	0.743	0.819	0.600						
1		0.657	0.724	0.790	0.743	0.667						
10		0.676	0.857	0.771	0.724	0.895						
50		0.724	0.657	0.829	0.667	0.781						
100		0.610	0.648	0.667	0.695	0.562						

CETIS Analytical Report

Report Date: 29 Nov-18 10:52 (p 2 of 2)
Test Code: 31191Ap-Comp5 | 10-8867-6865

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 00-0356-4508		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:51		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 04-7993-6295		Code: 31246-122			Client: AECOM							
Sample Date: 21 Nov-18 10:30		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 10:30		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 5 Elutriate (TB-1,-2)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	29971	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.07	2.82	0.7789	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.781	0.0%	
1		5	0.739	0.695	0.810	0.046	6.15%	2.27%	388/525	0.781	0.0%	
10		5	0.823	0.705	0.943	0.096	11.60%	-8.82%	432/525	0.781	0.0%	
50		5	0.806	0.743	0.876	0.056	6.97%	-6.55%	423/525	0.781	0.0%	
100		5	0.758	0.686	0.810	0.055	7.25%	-0.25%	398/525	0.758	2.93%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.876	0.705	0.762	0.829	0.610						
1		0.695	0.733	0.810	0.752	0.705						
10		0.705	0.895	0.800	0.771	0.943						
50		0.800	0.762	0.876	0.743	0.848						
100		0.714	0.781	0.810	0.800	0.686						

CETIS Test Data Worksheet

Report Date: 28 Nov-18 11:30 (p 1 of 1)
Test Code/ID: 18-1606-1086/31191Ap-Comp6

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	21 Nov-18 13:10	Species:	Arbacia punctulata	Sample Code:	31246-123		
End Date:	24 Nov-18 09:35	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	21 Nov-18 10:30	Material:	Elutriate Solution	Sample Station:	Comp 6 Elutriate (CAD-1,-2,-3)		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	L	1	1	105	92	90	
0	L	2	8	105	74	72	
0	L	3	12	105	80	78	
0	L	4	19	105	87	86	
0	L	5	23	105	64	63	
1		1	3	105	76	74	
1		2	10	105	78	77	
1		3	11	105	85	83	
1		4	18	105	80	77	
1		5	25	105	71	70	
10		1	5	105	68	66	
10		2	7	105	72	69	
10		3	15	105	66	62	
10		4	17	105	54	49	
10		5	21	105	76	69	
50		1	4	105	85	78	
50		2	6	105	60	57	
50		3	13	105	70	64	
50		4	16	105	81	74	
50		5	24	105	71	66	
100		1	2	105	75	68	
100		2	9	105	89	82	
100		3	14	105	86	77	
100		4	20	105	86	79	
100		5	22	105	89	79	

CETIS Summary Report

Report Date: 29 Nov-18 10:53 (p 1 of 1)
Test Code: 31191Ap-Comp6 | 18-1606-1086

Echinoid Embryo-Larval Survival and Development Test **EnviroSystems, Inc.**

Batch ID: 12-6433-1735	Test Type: Survival-Development	Analyst: Nancy Roka
Start Date: 21 Nov-18 13:10	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 24 Nov-18 09:35	Species: Arbacia punctulata	Brine: Not Applicable
Duration: 68h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample ID: 06-7274-4728	Code: 31246-123	Client: AECOM
Sample Date: 21 Nov-18 10:30	Material: Elutriate Solution	Project: Dredged Sediment Evaluation
Receipt Date: 21 Nov-18 10:30	Source: New Haven Harbor 2018	
Sample Age: 3h	Station: Comp 6 Elutriate (CAD-1,-2,-3)	

Point Estimate Summary								
Analysis ID	Endpoint	Point Estimate Method	Level	%	95% LCL	95% UCL	TU	✓
09-4681-0209	Proportion Normal	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓
17-2040-7663	Proportion Survived	Linear Interpolation (ICPIN)	EC50	>100	n/a	n/a	<1	✓

Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.741	0.613	0.869	0.600	0.857	0.046	0.103	13.92%	0.00%
1		5	0.726	0.669	0.782	0.667	0.790	0.020	0.045	6.25%	2.06%
10		5	0.600	0.501	0.699	0.467	0.657	0.036	0.079	13.23%	19.02%
50		5	0.646	0.547	0.744	0.543	0.743	0.035	0.079	12.27%	12.85%
100		5	0.733	0.670	0.796	0.648	0.781	0.023	0.051	6.93%	1.03%

Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.756	0.626	0.886	0.610	0.876	0.047	0.105	13.84%	0.00%
1		5	0.743	0.682	0.804	0.676	0.810	0.022	0.049	6.60%	1.76%
10		5	0.640	0.542	0.738	0.514	0.724	0.035	0.079	12.38%	15.37%
50		5	0.699	0.582	0.816	0.571	0.810	0.042	0.094	13.44%	7.56%
100		5	0.810	0.741	0.878	0.714	0.848	0.025	0.055	6.81%	-7.05%

Proportion Normal Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.857	0.686	0.743	0.819	0.600	
1		0.705	0.733	0.790	0.733	0.667	
10		0.629	0.657	0.590	0.467	0.657	
50		0.743	0.543	0.610	0.705	0.629	
100		0.648	0.781	0.733	0.752	0.752	

Proportion Survived Detail							
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	L	0.876	0.705	0.762	0.829	0.610	
1		0.724	0.743	0.810	0.762	0.676	
10		0.648	0.686	0.629	0.514	0.724	
50		0.810	0.571	0.667	0.771	0.676	
100		0.714	0.848	0.819	0.819	0.848	

CETIS Analytical Report

Report Date: 29 Nov-18 10:53 (p 1 of 2)
Test Code: 31191Ap-Comp6 | 18-1606-1086

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 09-4681-0209		Endpoint: Proportion Normal			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:53		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 06-7274-4728		Code: 31246-123			Client: AECOM							
Sample Date: 21 Nov-18 10:30		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 10:30		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	274037	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.1	2.82	0.7106	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Normal Summary												
Conc-%	Code	Count	Calculated Variate(A/B)							Isotonic Variate		
			Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.741	0.600	0.857	0.103	13.90%	0.0%	389/525	0.741	0.0%	
1		5	0.726	0.667	0.790	0.045	6.25%	2.06%	381/525	0.726	2.06%	
10		5	0.600	0.467	0.657	0.079	13.20%	19.0%	315/525	0.66	11.0%	
50		5	0.646	0.543	0.743	0.079	12.30%	12.9%	339/525	0.66	11.0%	
100		5	0.733	0.648	0.781	0.051	6.93%	1.03%	385/525	0.66	11.0%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.857	0.686	0.743	0.819	0.600						
1		0.705	0.733	0.790	0.733	0.667						
10		0.629	0.657	0.590	0.467	0.657						
50		0.743	0.543	0.610	0.705	0.629						
100		0.648	0.781	0.733	0.752	0.752						

CETIS Analytical Report

Report Date: 29 Nov-18 10:53 (p 2 of 2)
 Test Code: 31191Ap-Comp6 | 18-1606-1086

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Analysis ID: 17-2040-7663		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 29 Nov-18 10:53		Analysis: Linear Interpolation (ICPIN)			Official Results: Yes							
Sample ID: 06-7274-4728		Code: 31246-123			Client: AECOM							
Sample Date: 21 Nov-18 10:30		Material: Elutriate Solution			Project: Dredged Sediment Evaluation							
Receipt Date: 21 Nov-18 10:30		Source: New Haven Harbor 2018										
Sample Age: 3h		Station: Comp 6 Elutriate (CAD-1,-2,-3)										
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Log(X+1)	Linear	821222	200	Yes	Two-Point Interpolation							
Residual Analysis												
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.02	2.82	0.8996	No Outliers Detected							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC50	>100	n/a	n/a	<1	n/a	n/a						
Proportion Survived Summary			Calculated Variate(A/B)							Isotonic Variate		
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect	
0	L	5	0.756	0.610	0.876	0.105	13.80%	0.0%	397/525	0.756	0.0%	
1		5	0.743	0.676	0.810	0.049	6.60%	1.76%	390/525	0.743	1.76%	
10		5	0.640	0.514	0.724	0.079	12.40%	15.4%	336/525	0.716	5.29%	
50		5	0.699	0.571	0.810	0.094	13.40%	7.56%	367/525	0.716	5.29%	
100		5	0.810	0.714	0.848	0.055	6.81%	-7.05%	425/525	0.716	5.29%	
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	L	0.876	0.705	0.762	0.829	0.610						
1		0.724	0.743	0.810	0.762	0.676						
10		0.648	0.686	0.629	0.514	0.724						
50		0.810	0.571	0.667	0.771	0.676						
100		0.714	0.848	0.819	0.819	0.848						

Suspended Particulate Phase

Failed Assays

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31248	Incubator ID:	20
Project:	New Haven	Client:	AECOM

Composites 1, 2, 6

Summary of Test Conditions

Exposure	Species Used
Test Mode: Static, non-renewal Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i> : 96 hours <i>Arbacia</i> : 48- 72 hours	(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input checked="" type="checkbox"/> Silverside Minnow (<i>Menidia. beryllina</i>) <input type="checkbox"/> Sea Urchin (<i>Arbacia</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> and <i>M. beryllina</i> : 30 ± 2 ppt <i>Arbacia</i> : 30 ± 1 ppt (E3) JTP 12/07/18 2	Temperature: <i>A. bahia</i> and <i>M. beryllina</i> : 20 ± 2 °C <i>Arbacia</i> : 16 ± 2 °C (E3) JTP 12/07/18 20 ± 1 °C
pH: 7.8 ± 0.5	Photoperiod: 16 hour light, 8 hour dark

Test Chamber	Solution Volume
(Check box for all that apply) <input type="checkbox"/> 250 mL beaker <input type="checkbox"/> 600 mL beaker <input checked="" type="checkbox"/> other 200 mL Tumbler	(Check box for all that apply) <input checked="" type="checkbox"/> 200 mL/replicate <input type="checkbox"/> 400 mL/replicate <input type="checkbox"/> other _____

Replicate Information

<i>A. bahia</i> and <i>M. beryllina</i>: <ul style="list-style-type: none"> 5 Reps per treatment 10 organisms per chamber 	<i>Arbacia</i>: <ul style="list-style-type: none"> 5 Reps per treatment 20-30 embryos/mL
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Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).	Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)

Feeding

<i>A. bahia</i>: Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day	<i>M. beryllina</i>: Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day
<i>Arbacia</i>: NONE	

Date: 10/25/18	Initial: GRS
----------------	--------------



CSARE MBAR0102418

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species MENIDIA BERYLLINA

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10-16-18 Receipt date _____

Lot number 101318 MB Strain _____

Brood origination CAPE COD MA

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. _____ ppm

pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers YCT _____ Other ENCYCLIMET

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: EST / ENTKALPY # of Organisms 2800+

Carrier: _____ Date shipped 10-24-18

Biologist: Mark Overgaard

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven
ASSAY: MB96SPP
SPECIES: *M. beryllina*

BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 1124024313

Date / Initials: 10/25/18 GRS

Rep	
1	0.00546
2	0.00414
3	0.00636
4	0.00218
5	0.00336
6	0.00176
7	0.00147
8	0.00214
9	0.00202
10	0.00286
11	0.00232
12	0.00345
13	0.00338
14	0.00585
15	0.00222
16	0.00169
17	0.00114
18	0.00174
19	0.00105
20	0.00333

Mean Weight (g): 0.00290
Test Volume (L): 0.2
Loading Rate(g/L): 0.14480

PREPARATION of DILUTIONS

STUDY: 31248 **CLIENT:** AECOM **DILUENT:** CLDS
SPECIES: A.bahia and M. beryllina **TEST:** Suspended Particulate Phase (SPP)

Diluent:	Composite #: CLDS		Composite #: comp1		Composite #: comp2		Composite #: comp4		
	Elutriate ID: 31242-009		Elutriate ID: 31246-101		Elutriate ID: 31246-102-103		Elutriate ID: 31246-111		
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	
Lab	/		0	2,000	0	2,000	0	2,000	
(RW)			0	↓	0	↓	0	↓	
1 %			20		200		200		200
10 %			200		1,000		1,000		1,000
50 %			1,000		2,000		2,000		2,000
100 %			2,000						
Initial					MW		MW		LAG
Date			10/25/18		10/25/18		10/25/18		
Time			1505	1550	1655				
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		
Initial Salinity (ppt)	27.4		24.9		24.8		24.2		
Vol of Elutriate (mL)	50,000		8,000		8,000		5,500		
Grams of Salt (g)	149.8		47.0		47.9		36.7		
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117		
Final Salinity	27.9		28.1		27.9		29.9		
Date & Initial	10/25/18	MW	10/25/18	MW	10/25/18	MW	10/25/18	CFS	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 **Project:** New Haven **Client:** AECOM **Incubator ID:**
Test Species: *Menidia beryllina* **Lot ID:** 08MBAR0102418 **Sample:** Controls **Diluent:** CLDS

(P) GRS 10/26 Project ended due to failure in Lab Control

SURVIVAL - Controls

Conc	Rep	HOURS						Conc	Rep	HOURS						
		0	1	24	48	72	96			0	1	24	48	72	96	
LAB control water)	A	10	10	10	/			CLDS (Reference Water)	A	10	10	9	/			
	B	10	10	8					B	10	10	10				
	C	10	10	8					C	10	10	10				
	D	10	10	8					D	10	10	9				
	E	10	10	9					E	10	10	10				
Initials		CFS	LAG	GRS	Comments:											
Date		10/25/18	10/25	10/26/18												
Time		1720	1820	1100												

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
-200, -213	/
NOTES	
Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
LAB	A	7.7	7.0	/			7.96	7.88	/			20	20	/			31	32	/								
(RW)	A	8.5	7.2				7.91	7.91				20	20				29	30									
Initials		MT	MW	RECORD OF METERS USED																							
Date		10/25	10/26	Exposure (Hours)																							
Time		155	100																								
Incub. Temp		21	21																								
FEEDING: <i>Artemia nauplii</i> (A-5179)																											
Fed By:		MT																									

GRS 10/26 Test ended early due to failure in Lab Control

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 Project: New Haven Client: AECOM Incubator ID:
 Test Species: *Menidia beryllina* Lot ID: 08MBARD102418 Sample: Composite #1 Diluent: CLDS

SURVIVAL - Composite # 1

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	/			
	B	10	16				
	C	10	16				
	D	10	16				
	E	10	10				
10 %	A	10	10				
	B	10	16				
	C	10	10				
	D	10	16				
	E	10	10				
Initials		CFS	LAG				
Date		10/25/18	10/25				
Time		1730	1830				

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	/			
	B	10	10				
	C	10	16				
	D	10	10				
	E	10	10				
100 %	A	10	10				
	B	10	10				
	C	10	10				
	D	10	16				
	E	10	10				
Comments:							

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
-201-201	/

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)							
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
1 %	A	8.1	7.7	/			7.91	7.85	/			20	20	/			29	29	/										
10 %	A	8.2	7.8				7.88	7.90				20	20							29	29								
50 %	A	8.1	7.8				7.82	8.02				20	20							29	29								
100 %	A	6.7	7.1				7.68	8.10				21	20							29	30								

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED					Water Quality Station #1					Water Quality Station #2												
				Exposure (Hours)					Water Quality Station #					Water Quality Station #												
MT	10/25	1515	21	0	24	48	72	96	1	1																
									ML02	ML02							ML02	ML02								
									ML02	ML02							160	163								
									MT	MW							ML02	ML02								

FEEDING: *Artemia nauplii* (A-5179)

Fed By: MT

⑩ Test ended ^{at 17:45} early due to failure in Lab Control

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 Project: New Haven Client: AECOM Incubator ID:
 Test Species: *Menidia beryllina* Lot ID: 08MBARD0102418 Sample: Composite #2 Diluent: CLDS

SURVIVAL - Composite # 1 2 ^③ CFS 10/25

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10	10	/			
	B	10	10				
	C	10	10				
	D	10	10				
	E	10	10				
10 %	A	10	10	/			
	B	10	10				
	C	10	10				
	D	10	10				
	E	10	10				
Initials		CFS	MW				
Date		10/25/18	10/25/18				
Time		17:45	18:15				

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10	10	/			
	B	10	10				
	C	10	10				
	D	10	10				
	E	10	10				
100 %	A	10	10	/			
	B	10	10				
	C	10	10				
	D	10	10				
	E	10	10				

Comments:

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
-205-208	/

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 ± 0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)								
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96				
1 %	A	8.1	7.4	/			7.87	7.83	/			20	20	/			29	29	/											
10 %	A	8.2	7.5				7.84	7.93				19	20				29	29												
50 %	A	7.5	7.2				7.74	8.07				18	19				29	29												
100 %	A	8.0	7.3				7.78	8.13				19	19				29	29												

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)							
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
1 %	A	8.1	7.4	/			7.87	7.83	/			20	20	/			29	29	/										
10 %	A	8.2	7.5				7.84	7.93				19	20				29	29											
50 %	A	7.5	7.2				7.74	8.07				18	19				29	29											
100 %	A	8.0	7.3				7.78	8.13				19	19				29	29											
Initials		MT	MW				RECORD OF METERS USED										Water Quality Station #1					Water Quality Station #2							
Date		10/25	10/26				Exposure (Hours)										DO Meter #	MLO2	DO Meter #										
Time		1555	1020				0	24	48	72	96	DO Probe #	160	DO Probe #															
Incub. Temp		21	21				Water Quality Station #	1	1			pH Meter #	MLO2	pH Meter #															
FEEDING: <i>Artemia nauplii</i> (A-0179)							Thermometer or Probe #	MLO2	MLO2			pH Probe #	163	pH Probe #															
Fed By:		MT					Initial	MT	MW			Salinity Meter #	MLO2	Salinity Meter #															

⑩ GRS 10/26 Test ended ~~early~~ ^{CFS} early due to failure ~~due to lab failure~~ ^{GRS 10/24} in Lab Control

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #: 31248 Project: New Haven Client: AECOM Incubator ID:
 Test Species: *Menidia beryllina* Lot ID: 08MBA0102418 Sample: Composite #6 Diluent: CLDS

SURVIVAL - Composite #1 G CFS 10/25

Conc	Rep	HOURS					
		0	1	24	48	72	96
1 %	A	10					
	B	10					
	C	10					
	D	10					
	E	10					
10 %	A	10					
	B	10					
	C	10					
	D	10					
	E	10					
Initials		CFS					
Date		10/25/18					
Time		1800					

Conc	Rep	HOURS					
		0	1	24	42	72	96
50 %	A	10					
	B	10					
	C	10					
	D	10					
	E	10					
100 %	A	10					
	B	10					
	C	10					
	D	10					
	E	10					
Comments:							

Ammonia pulled on 100% and Controls

** If complete mortality is observed in a treatment prior to 96 hours, pull bottles for Ammonia **

Start	End
-209-212	

NOTES

Dissolved Oxygen	> 40% saturation
Temperature	20 ± 1 C
Salinity	30 ppt ± 2 ppt
pH	7.8 "0.5

DAILY WATER QUALITIES

Conc	Rep	Dissolved Oxygen (mg/L)					pH (SU)					Temperature (C)					Salinity (ppt)					Modified Salinity (if required)					
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	
1 %	A	8.1	7.6				7.85	7.90				21	19				29	29									
10 %	A	8.1	7.4				7.88	7.96				21	19				29	29									
50 %	A	7.9	7.4				7.95	8.04				20	19				30	30									
100 %	A	7.4	7.1				7.97	8.10				20	19				31	31									

Initials	Date	Time	Incub. Temp	RECORD OF METERS USED					Water Quality Station #1		Water Quality Station #2	
				Exposure (Hours)					DO Meter #	DO Probe #	DO Meter #	DO Probe #
MT MW	10/25 10/26	1855 1030	21 21	0	24	48	72	96	MLOZ	160		
				Water Quality Station #	1	1			pH Meter #	MLOZ		
				Thermometer or Probe #	MLOZ	MLOZ			pH Probe #	163		
				Initial	MT	MW			Salinity Meter #	MLOZ		

FEEDING: *Artemia nauplii* (A-3179)

Fed By: MT

Assay Review Checklist

DATE IN: _____
 DATE DUE: _____

STUDY#: 31248
 CLIENT: AECOM
 PROJECT: New Haven
 ASSAY: Mb96AD

Project Paperwork Check for Completeness			
	Date	Initials	Comments
Day 0	10/25/18	CFS	
Day 1	10/26/18	GRS	Test ended early due to failure in lab control
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			
Day 8			

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete			
Sample Receipt Complete			
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
TRC Values & Bottle Numbers			
Daphnid Calculations Complete			
Weights Reported			
Assay Acceptability Review			

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete			
Statistical Analysis Reviewed			
Data Acceptability Review			
Supporting Chemistry Report			
Draft Report			
QA Audit/Review Complete			
Final Report Reviewed			
Final Report Printed - PDF			
Executive Summary / Chems Sent			
Report E-mailed / Faxed			
Report Logged Out / Invoice Sent			
Report Scanned to Archive			

SUSPENDED PARTICULATE PHASE ACUTE BIOASSAY

Study #:	31291	Incubator ID:	
Project:	New Haven	Client:	AECOM

Summary of Test Conditions

Exposure	Species Used
<p>Test Mode: Static, non-renewal</p> <p>Length of Assay: <i>A. bahia</i> and <i>M. beryllina</i>: 96 hours <i>Arbacia</i>: 48- 72 hours</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>)</p> <p><input type="checkbox"/> Silverside Minnow (<i>Menidia beryllina</i>)</p> <p><input checked="" type="checkbox"/> Sea Urchin (<i>Arbacia</i>)</p>

Water Quality Parameters

<p>Salinity: <i>A. bahia</i> and <i>M. beryllina</i>: 30 ± 2 ppt <i>Arbacia</i>: 30 ± 3 ppt <small>(ES) NR 11/1/18</small></p> <p>pH: 7.8 ± 0.5</p>	<p>Temperature: <i>A. bahia</i> and <i>M. beryllina</i>: 20 ± 2 °C <i>Arbacia</i>: 16 ± 2 °C 20 ± 1 °C <small>(ES) NR 11/1/18</small></p> <p>Photoperiod: 16 hour light, 8 hour dark</p>
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Test Chamber	Solution Volume
<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 250 mL beaker</p> <p><input type="checkbox"/> 600 mL beaker</p> <p><input type="checkbox"/> other _____</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 200 mL/replicate</p> <p><input type="checkbox"/> 400 mL/replicate</p> <p><input type="checkbox"/> other _____</p>

Replicate Information

<p><i>A. bahia</i> and <i>M. beryllina</i>:</p> <ul style="list-style-type: none"> • 5 Reps per treatment • 10 organisms per chamber 	<p><i>Arbacia</i>:</p> <ul style="list-style-type: none"> • 5 Reps per treatment • 20-30 embryos/mL
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Cleaning	Treatments
<p>Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed and rinsed with deionized water (EPA 2002).</p>	<p>Laboratory Control, disposal site reference water, undiluted elutriate solution (100%) and diluted elutriate solutions (concentrations 50%, 10%, 1%)</p>

Feeding

<p><i>A. bahia</i>:</p> <p>Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i> - 0.2mL/day</p>	<p><i>M. beryllina</i>:</p> <p>Fed newly hatched, <24 hour old <i>Artemia nauplii</i> after 48 hrs - 0.2mL/day</p>
<p><i>Arbacia</i>: NONE</p>	

Date: 10/31/18

Initial CFS



99AP ARO080118

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Arbacia punctulata

Source: Lab reared _____ Hatchery reared _____ Field collected

Hatch date mixed ages Receipt date 08/01/18

Lot number 080118AP Strain WILD

Brood origination NC

II. Water Quality

Temperature 16 °C Salinity 30 ppt D.O. SAT ppm

pH 8.2 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating _____ Flow through Static renewal _____

DIET: Flake food _____ Phytoplankton _____ Trout chow _____

Artemia _____ Rotifers _____ YCT _____ Other MARWALGAE

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: ESTI # of Organisms 50

Carrier: PROFESSIONAL PICKUP Date shipped 08/01/18

Biologist: Steve Sontora

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

PREPARATION of DILUTIONS

STUDY: 31291 CLIENT: AECOM DILUENT: CLDS
 SPECIES: A. punctulata TEST: Suspended Particulate Phase (SPP)

Diluent:	Composite #: 1		Composite #: 2		Composite #: 3		Composite #: 4	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1,000	0	1,000	0	1,000	0	1,000
(RW)	0	↓	0	↓	0	↓	0	↓
1 %	10	↓	10	↓	10	↓	10	↓
10 %	100	↓	100	↓	100	↓	100	↓
50 %	500	↓	500	↓	500	↓	500	↓
100 %	1,000	↓	1,000	↓	1,000	↓	1,000	↓
Initial	CFS		CFS		MW		CFS	
Date	10/31/18		10/31/18		10/31/18		10/31/18	
Time	1515		1530		1605		1545	
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	28 ²⁸ 25.6		28 ²⁸ 25.5		28 ²⁸ 25.3		28 ²⁸ 25.3	
Vol of Elutriate (mL)								
Grams of Salt (g)	E10		BG 12/13					
Lot number of Salt	A- 5117		A- 5117		A- 5117		A- 5117	
Final Salinity								
Date & Initial								

*(E10) Dr 12/13 salinity adjustment overlooked. For all these assays ^{at is listed} in the master spreadsheet.
 (E11) Bt 12/13 salinity adjustment was done at the same time*

PREPARATION of DILUTIONS

STUDY: 31291 **CLIENT:** AECOM **DILUENT:** CLDS
SPECIES: A. punctulata **TEST:** Suspended Particulate Phase (SPP)

Diluent:	Composite #: 5		Composite #: 6		Composite #: CLDS		Composite #:	
	Elutriate ID:		Elutriate ID:		Elutriate ID:		Elutriate ID:	
Concentration	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)	Vol Eff (mL)	Final Vol (mL)
Lab	0	1,000	0	1,000				
(RW)	0	↓	0	↓				
1 %	10	↓	10	↓				
10 %	100	↓	100	↓				
50 %	500	↓	500	↓				
100 %	1,000	↓	1,000	↓				
Initial	MW		MW					
Date	10/31/18		10/31/18					
Time	1555		1550					
	Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)		Salinity Adjustment Record (if necessary)	
Initial Salinity (ppt)	28 ^{26.2} _{at 1213}		28 ^{ES 20} ₁₂₁₃					
Vol of Elutriate (mL)			EW ^{ES} 1213 initial salinity and adjustment recorded					
Grams of Salt (g)			ES 26 1213 salinity adjustment recorded on multiple paperwork					
Lot number of Salt	A- 5117		A- 5117		A-		A-	
Final Salinity								
Date & Initial								

EMBRYO WORKSHEET

DATE: 10/31/18

ESI STUDY: 31291

CLIENT: AECOM

PROJECT: New Haven

Eggs Collected @: 1617

Pre-assay fertilization check: 92%

ANALYST: CFS

Sperm Collected @: 1632

A mated subsample of egg+sperm must achieve >90% fertilization in order to be used in testing.

Egg Stock Suspension Count:

Take 1mL of egg stock suspension and using a glass graduated cylinder dilute with seawater to a final volume of 100 mL. Count a subsample of the diluted suspension to get an estimate of the egg concentration. The diluted suspension should have 40 - 50 eggs/mL, (which would represent an egg concentration of 4,000 - 5,000 in the stock suspension.)

Egg Count (per mL) of diluted suspension: 4300

Sperm Stock Suspension Count:

- 1. Hemocytometer Count (E): 120
- 2. Hemocytometer Count (E): 125
- Average Count (E): 122
- Sperm Concentrations: Solution E X 40 =
- Solution E X 20 =
- Solution E X 5 =

Once added to the egg stock, the final sperm concentration should be $1 \times 10^5 - 1 \times 10^7$ in solution E.

$1.22 \times 10^4 \times 10^4 = \text{spm solution E} = 4.88 \times 10^6$

Solution B = 4.88×10^7

Solution C = 2.44×10^7

Solution D = 6.1×10^6

Sperm Count (per mL): 1.22×10^6

mL of Eggs to Add: 175 mL

mL of Sperm to Add: 30 mL

Gametes mixed @: 1725

Gametes must be mixed within 1 hour of collection.

Calculated Embryo Stock Concentration (per mL): 0.854 @CFS 10/31
0.692 mL

The test concentration should be 20 - 30 embryos per mL.

Calculated Embryo Stock (mL) needed per chamber: 1.17 mL

Add calculated amount of embryo stock to a surrogate chamber, gently mix, then count a 5mL aliquot.

Embryo Concentration Check: 124

If the check concentration is acceptable, then proceed with embryo addition to the test.

Volume Embryo Stock (mL) added to test solutions: 0.692 mL

Embryos Added to Test Solutions @: 1820

INITIAL COUNTS:	Embryos/ 5 mL
SURROGATE A	<u>143</u>
SURROGATE B	<u>131</u>
SURROGATE C	<u>135</u>
Mean:	<u>138</u>

Organism Lot ID: 99ApAR0080118

Mean per mL: 28

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31291	Client:	AECOM	Project:	New Haven
Test Species:	<i>A. punctulata</i>	Lot ID:	99APAR0080118	Diluent:	CLDS

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	START	END
Controls	Lab	7.7	7.3	7.94	7.95	21	20.4	30	30.4	-345	-423
	CLDS	8.5	7.3	7.98	7.98	21	20.4	29	29.2	-346	-424
Composite #1	1 %	8.4	7.3	7.89	7.99	21	20.4	29	29.3		
	10 %	8.2	7.3	7.94	8.00	21	20.4	29	29.4		
	50 %	7.9	7.3	7.90	8.02	21	20.3	28	29.2		
	100 %	7.3	7.3	7.81	8.02	21	20.5	28	27.7	-350	-428
Composite #2	1 %	8.3	7.3	7.95	7.97	20	19.9	29	29.62	<small>CFS 11/03</small>	
	10 %	8.2	7.3	7.95	8.01	20	20.5	29	29.3		
	50 %	7.6	7.3	7.91	8.03	20	20.4	29	29.0		
	100 %	6.3	7.2	7.85	8.06	20	20.4	28	28.4	-354	-432
Initials		MT	CFS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/31/18	11/03	Exposure				DO Meter #		DO Meter # MLO1	
Time		1615	1150					DO Probe #		DO Probe # 96	
Incub. Temp		21	21	Water Quality Station #		2	2	pH Meter #		pH Meter # MLO1	
Comments:				Thermometer or Probe #		MLO1	MLO1	pH Probe #		pH Probe # 158	
				Initial		MT	CFS	Salinity Meter		Salinity Meter MLO1/158	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31291	Client:	AECOM	Project:	New Haven
Test Species:	<i>A. punctulata</i>	Lot ID:	99ApAR0080118	Diluent:	CLDS

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	START	END
Composite #3	1 %	8.2	7.3	7.93	8.03	20	20.5	29	29.6		
	10 %	8.3	7.3	7.94	8.03	19	20.5	30	29.6		
	50 %	7.6	7.3	7.89	8.03	20	20.5	29	30.1		
	100 %	6.2	7.3	7.79	8.07	21	20.5	28	27.9	-358	-436
Composite #4	1 %	8.3	7.2	7.94	8.04	20	20.5	29	30.4		
	10 %	8.3	7.3	7.95	8.04	20	20.5	29	29.8		
	50 %	7.6	7.3	7.92	8.05	20	20.6	28	29.2		
	100 %	6.4	7.2	7.91	8.08	21	20.5	28	28.2	-362	-440
Initials		MT	CFS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/31/18	11/03	Exposure				DO Meter #		DO Meter # MLO1	
Time		1605	1200			0	24	DO Probe #		DO Probe # 96	
Incub. Temp		21	21	Water Quality Station #		2	2	pH Meter #		pH Meter # MLO1	
Comments:				Thermometer or Probe #		MLO1	MLO1	pH Probe #		pH Probe # 158	
				Initial		MT	CFS	Salinity Meter		Salinity Meter MLO1/159	

SUSPENDED PHASE ACUTE BIOASSAY DATA SUMMARY

Study #:	31291	Client:	AECOM	Project:	New Haven
Test Species:	<i>A. punctulata</i>	Lot ID:	99APAR0080118	Diluent:	CLDS

DAILY WATER QUALITIES

Concentration		Dissolved Oxygen (mg/L)		pH (SU)		Temperature (C)		Salinity (ppt)		Ammonia pulled on 100% and Controls	
		0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	0 hr	END 72 hr	START	END
Composite #5	1 %	8.1	7.3	7.91	8.03	20	20.4	29	29.4		
	10 %	8.0	7.3	7.94	8.04	20	20.4	29	29.2		
	50 %	7.4	7.3	7.89	8.06	20	20.4	28	29.8		
	100 %	6.4	7.4	7.83	8.11	20	20.5	28	28.9	-366	-444
Composite #6	1 %	8.2	7.3	7.92	8.04	20	8.0 20.6	29	29.1		
	10 %	8.1	7.3	7.94	8.04	20	20.6 20.6	29	29.1		
	50 %	7.4	7.3	7.93	8.05	21	20.4	28	29.4		
	100 %	6.4	7.2	7.93	8.08	22	20.5	28	27.9	-370	-448
Initials		MT	CFS	RECORD OF METERS USED				WQ Station #1		WQ Station #2	
Date		10/31/18	11/03	Exposure				DO Meter #		DO Meter #	MLO1
Time		1555	1205		0	24	DO Probe #		DO Probe #	96	
Incub. Temp		21	21	Water Quality Station #	2	2	pH Meter #		pH Meter #	MLO1	
Comments:				Thermometer or Probe #	MLO1	MLO1	pH Probe #		pH Probe #	158	
				Initial	MT	CFS	Salinity Meter		Salinity Meter	MLO1/159	

Arbacia Punctulata Survival / Development Assay

ESI Study: 31291

Assay Start: 10/31/18 1820

Client: AECOM

Assay End: 11/03/18 1136

Count Date: 11/05/18

Initials: GRS

e10 GRS 11/03

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Lab Control Water	70/66	60/56	57/51	77/71	76/69
CLDS Reference Water					
Composite 1 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					
Composite 2 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					

e10 GRS 11/03

Test Lab Control did not meet passing criteria, due to this the rest of the test was not counted. The test will be reran at a later date.

***Arbacia Punctulata* Survival / Development Assay**

ESI Study: 31291 Assay Start: 10/31/18 1820
 Client: AECOM Assay End: 11/03/18 1136
 Count Date: _____ Initials: _____

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Composite 3 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					
Composite 4 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					

Arbacia Punctulata Survival / Development Assay

ESI Study: 31291 Assay Start: 10/31/18 1820
 Client: AECOM Assay End: 11/03/18 1130
 Count Date: _____ Initials: _____

Treatment	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
Composite 5 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					
Composite 6 Elutriate	REP A Alive / Normal	REP B Alive / Normal	REP C Alive / Normal	REP D Alive / Normal	REP E Alive / Normal
1%					
10%					
50%					
100%					

CETIS Test Data Worksheet

Report Date: 29 Nov-18 10:36 (p 1 of 1)
Test Code/ID: 04-5451-2098/31291Ap-Failed

Echinoid Embryo-Larval Survival and Development Test				EnviroSystems, Inc.			
Start Date:	31 Oct-18 18:20	Species:	Arbacia punctulata	Sample Code:	31246-112		
End Date:	03 Nov-18 11:30	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	New Haven Harbor 2018		
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution	Sample Station:	Comp 1 Elutriate (V,W')		

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Normal	Notes
0	LS	1	5	138	70	66	
0	LS	2	8	138	60	56	
0	LS	3	14	138	57	51	
0	LS	4	23	138	77	71	
0	LS	5	28	138	76	69	
0	R	1	4	138			
0	R	2	7	138			
0	R	3	18	138			
0	R	4	22	138			
0	R	5	27	138			
1		1	6	138			
1		2	11	138			
1		3	17	138			
1		4	19	138			
1		5	25	138			
10		1	3	138			
10		2	9	138			
10		3	15	138			
10		4	24	138			
10		5	30	138			
50		1	2	138			
50		2	12	138			
50		3	16	138			
50		4	21	138			
50		5	29	138			
100		1	1	138			
100		2	10	138			
100		3	13	138			
100		4	20	138			
100		5	26	138			

CETIS Summary Report

Report Date: 07 Nov-18 10:53 (p 1 of 1)
Test Code: 31291Ap-Failed | 04-5451-2098

Echinoid Embryo-Larval Survival and Development Test										EnviroSystems, Inc.		
Batch ID:	11-6207-0335	Test Type:	Survival-Development				Analyst:	Nancy Roka				
Start Date:	31 Oct-18 18:20	Protocol:	EPA/600/R-95/136 (1995)				Diluent:	CLDS Reference Site				
Ending Date:	03 Nov-18 11:30	Species:	Arbacia punctulata				Brine:	Not Applicable				
Duration:	65h	Source:	ARO - Aquatic Research Organisms, NH				Age:					
Sample ID:	12-3991-1381	Code:	31246-112				Client:	AECOM				
Sample Date:	31 Oct-18 10:40	Material:	Elutriate Solution				Project:	Dredged Sediment Evaluation				
Receipt Date:	31 Oct-18 10:40	Source:	New Haven Harbor 2018									
Sample Age:	8h	Station:	Comp 1 Elutriate (V,W')									
Point Estimate Summary												
Analysis ID	Endpoint	Point Estimate Method					Level	%	95% LCL	95% UCL	TU	✓
10-3544-6999	Proportion Normal	Linear Interpolation (ICPIN)					EC50	100	100	100	1	✓
04-9379-9706	Proportion Survived	Linear Interpolation (ICPIN)					EC50	100	100	100	1	✓
Proportion Normal Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LS	5	0.454	0.376	0.532	0.370	0.514	0.028	0.063	13.86%	0.00%	
Proportion Survived Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LS	5	0.493	0.411	0.575	0.413	0.558	0.030	0.066	13.44%	0.00%	
Proportion Normal Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	LS	0.478	0.406	0.370	0.514	0.500						
0	R											
1												
10												
50												
100												
Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	LS	0.507	0.435	0.413	0.558	0.551						
0	R											
1												
10												
50												
100												

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: Suspended Particulate Phase
TASK: Elutriate/SPP Ammonia - Unmitigated Sediment
METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions are
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) a
 Where: $I = \text{Ionic Strength} = (19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$

$pK_a = \text{ionization constant of ammonium ion in aqueous saline solution} (+9$
 $\text{FNH}_3 = \text{fraction of UIA} = (1 + 10^{(R_{11} + 0.0324 \cdot (298 - P_{11})) + ((0.0415 \cdot 1) / P_1)}$
 $\text{Tot NH}_3 = \text{total ammonia, or QLimit if ND}$
 $\text{pressure in FNH}_3 \text{ assumed to be 1 atm}$

Sample ID	Hour	ESI Code	Ammonia				Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R pKa	S FNH3
			Total	Qual	Unionized	QLimit											
Comp 3 (US-1, US-2) 10%	0	31248-229	3		0.0659	0.1 mg/L as N	10/26/18 1530	10/28/18	20.0	7.82	28	3	293.15	0.57	9.312	0.022	
Comp 3 (US-1, US-2) 50%	0	31248-230	16		0.2909	0.1 mg/L as N	10/26/18 1530	10/28/18	20.2	7.73	28	16	293.35	0.57	9.312	0.0182	
Comp 3 (US-1, US-2) 100%	0	31248-231	34		0.5453	0.2 mg/L as N	10/26/18 1530	10/28/18	19.8	7.69	29	34	292.95	0.6	9.314	0.016	
Comp 4 (DS-1, DS-2) 1%	0	31248-232	0.26		0.0052	0.1 mg/L as N	10/26/18 1530	10/28/18	18.4	7.83	27.5	0.26	291.55	0.56	9.31	0.02	
Comp 4 (DS-1, DS-2) 10%	0	31248-233	2.6		0.0581	0.1 mg/L as N	10/26/18 1530	10/28/18	19.3	7.85	27.9	2.6	292.45	0.57	9.311	0.0223	
Comp 4 (DS-1, DS-2) 50%	0	31248-234	14.3		0.2914	0.1 mg/L as N	10/26/18 1530	10/28/18	19.6	7.80	28.0	14.3	292.75	0.57	9.312	0.0204	
Comp 4 (DS-1, DS-2) 100%	0	31248-235	27		0.5174	0.1 mg/L as N	10/26/18 1530	10/28/18	20.0	7.76	28.1	27	293.15	0.58	9.312	0.0192	
Comp 5 (TB-1, TB-2) 1%	0	31248-236	0.34		0.0083	0.1 mg/L as N	10/26/18 1530	10/28/18	18.9	7.90	27.9	0.34	292.05	0.57	9.311	0.0243	
Comp 5 (TB-1, TB-2) 10%	0	31248-237	3.5		0.0736	0.1 mg/L as N	10/26/18 1530	10/28/18	19.1	7.83	28.0	3.5	292.25	0.57	9.312	0.021	
Comp 5 (TB-1, TB-2) 50%	0	31248-238	16		0.2410	0.1 mg/L as N	10/26/18 1530	10/28/18	19.2	7.68	28.3	16	292.35	0.58	9.312	0.0151	
Comp 5 (TB-1, TB-2) 100%	0	31248-239	37		0.5314	0.2 mg/L as N	10/26/18 1530	10/28/18	19.2	7.66	28.7	37	292.35	0.59	9.313	0.0144	
<u>A. punctulata Start</u>																	
Laboratory Control	0	31248-200	ND		0.0031	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.98	31	0.1	293.15	0.64	9.319	0.0309	
CLDS Reference	0	31248-213	ND		0.0025	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	19	7.91	29	0.1	292.15	0.6	9.314	0.0249	
Comp 1 (V, W) 1%	0	31248-201	0.26		0.0065	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	19	7.91	29	0.26	292.15	0.6	9.314	0.0249	
Comp 1 (V, W) 10%	0	31248-202	3.1		0.0724	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.85	29	3.1	293.15	0.6	9.314	0.0234	
Comp 1 (V, W) 50%	0	31248-203	16		0.2983	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.75	29	16	293.15	0.6	9.314	0.0186	
Comp 1 (V, W) 100%	0	31248-204	33		0.5650	0.2 mg/L as N	10/25/18 1500	10/26/18 1145	21	7.68	29	33	294.15	0.6	9.314	0.0171	
Comp 2 (R, S) 1%	0	31248-205	0.29		0.0071	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.87	29	0.29	293.15	0.6	9.314	0.0244	
Comp 2 (R, S) 10%	0	31248-206	3.1		0.0724	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.85	29	3.1	293.15	0.6	9.314	0.0234	
Comp 2 (R, S) 50%	0	31248-207	17		0.3391	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.78	29	17	293.15	0.6	9.314	0.0199	
Comp 2 (R, S) 100%	0	31248-208	35		0.6236	0.2 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.73	29	35	293.15	0.6	9.314	0.0178	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	0	31248-209	0.2		0.0051	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	21	7.86	29	0.2	294.15	0.6	9.314	0.0257	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	0	31248-210	1.1		0.0309	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	21	7.90	29	1.1	294.15	0.6	9.314	0.0281	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	0	31248-211	5.9		0.1844	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	21	7.95	30	5.9	294.15	0.62	9.317	0.0312	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	0	31248-212	12		0.3627	0.1 mg/L as N	10/25/18 1500	10/26/18 1145	20	7.97	31	12	293.15	0.64	9.319	0.0302	
Laboratory Control	0	31248-243	ND		0.0025	0.1 mg/L as N	10/27/18 1000	10/28/18	19.0	7.92	31	0.1	292.15	0.64	9.319	0.0251	
CLDS Reference	0	31248-244	ND		0.0026	0.1 mg/L as N	10/27/18 1000	10/28/18	18.5	7.95	30	0.1	291.65	0.62	9.317	0.0261	
Comp 3 (US-1, US-2) 100%	0	31248-240	34		0.6400	0.2 mg/L as N	10/27/18 1000	10/28/18	19.9	7.76	30	34	293.05	0.62	9.317	0.0188	
Comp 4 (DS-1, DS-2) 100%	0	31248-241	30		0.7342	0.2 mg/L as N	10/27/18 1000	10/28/18	20.1	7.87	30	30	293.25	0.62	9.317	0.0245	
Comp 5 (TB-1, TB-2) 100%	0	31248-242	36		0.6004	0.2 mg/L as N	10/27/18 1000	10/28/18	20.1	7.70	30	36	293.25	0.62	9.317	0.0167	

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: Suspended Particulate Phase
TASK: Elutriate/SPP Ammonia - Unmitigated Sediment
METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) a
 Where: I = Ionic Strength $(19.9273 \times N_{11}) / (1000 - 1.005109 \times N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9)
 FNH3 = fraction of UIA $(+1 / (1 + 10^{(R_{11} + 0.0324 \times (298 - P_{11})) + ((0.0415 \times 1) / P_1)})$
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia				Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R pKa	S FNH3
			Total	Qual	Unionized	QLimit											
<u>A. bahia End</u>																	
Laboratory Control	95	31248-260	1.6		0.0280	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.76	31	1.6	292.15	0.64	9.319	0.0175	
CLDS Reference	95	31248-261	1.6		0.0267	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.74	32	1.6	292.15	0.66	9.321	0.0167	
Comp 1 (V', W') 1%	95	31248-262	2.4		0.0349	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.68	32	2.4	292.15	0.66	9.321	0.0145	
Comp 1 (V', W') 10%	95	31248-263	4		0.0835	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.84	32	4	292.15	0.66	9.321	0.0209	
Comp 1 (V', W') 50%	95	31248-264	10		0.3992	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.13	32	10	292.15	0.66	9.321	0.0399	
Comp 1 (V', W') 100%	95	31248-265	17		0.9850	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.30	32	17	292.15	0.66	9.321	0.0579	
Comp 2 (R', S') 1%	95	31248-266	2.3		0.0462	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.82	31	2.3	292.15	0.64	9.319	0.0201	
Comp 2 (R', S') 10%	95	31248-267	3.8		0.1022	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.95	31	3.8	292.15	0.64	9.319	0.0269	
Comp 2 (R', S') 50%	95	31248-268	12		0.5620	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.20	31	12	292.15	0.64	9.319	0.0468	
Comp 2 (R', S') 100%	95	31248-269	19		1.2067	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.34	31	19	292.15	0.64	9.319	0.0635	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	95	31248-270	2.6		0.0496	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.80	32	2.6	292.15	0.66	9.321	0.0191	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	95	31248-271	3.1		0.0724	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	7.89	32	3.1	292.15	0.66	9.321	0.0234	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	95	31248-272	4.8		0.1668	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.07	33	4.8	292.15	0.68	9.324	0.0348	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	95	31248-273	6		0.3135	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	19	8.25	31	6	292.15	0.64	9.319	0.0522	
<u>M. beryllina End</u>																	
Laboratory Control	94	31248-316	1.4		0.0227	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.73	33	1.4	292.15	0.68	9.324	0.0162	
CLDS Reference	94	31248-317	1.5		0.0226	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.69	30	1.5	292.15	0.62	9.317	0.015	
Comp 3 (US-1, US-2) 1%	94	31248-318	1.6		0.0338	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.84	30	1.6	292.15	0.62	9.317	0.0211	
Comp 3 (US-1, US-2) 10%	94	31248-319	4.2		0.1129	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.95	31	4.2	292.15	0.64	9.319	0.0269	
Comp 3 (US-1, US-2) 50%	94	31248-320	14		0.6556	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	8.20	31	14	292.15	0.64	9.319	0.0468	
Comp 3 (US-1, US-2) 100%	94	31248-321	25		1.5126	0.2 mg/L as N	10/30/18 1530	11/02/18 1000	19	8.32	32	25	292.15	0.66	9.321	0.0605	
Comp 4 (DS-1, DS-2) 1%	94	31248-322	1.5		0.0339	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.87	30	1.5	292.15	0.62	9.317	0.0226	
Comp 4 (DS-1, DS-2) 10%	94	31248-323	3.5		0.0941	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.95	31	3.5	292.15	0.64	9.319	0.0269	
Comp 4 (DS-1, DS-2) 50%	94	31248-324	12		0.5871	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	8.22	31	12	292.15	0.64	9.319	0.0489	
Comp 4 (DS-1, DS-2) 100%	94	31248-325	22		1.3973	0.2 mg/L as N	10/30/18 1530	11/02/18 1000	19	8.34	31	22	292.15	0.64	9.319	0.0635	
Comp 5 (TB-1, TB-2) 1%	94	31248-326	2		0.0384	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	19	7.80	31	2	292.15	0.64	9.319	0.0192	
Comp 5 (TB-1, TB-2) 10%	94	31248-327	4.4		0.1028	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	18	7.92	31	4.4	291.15	0.64	9.319	0.0234	
Comp 5 (TB-1, TB-2) 50%	94	31248-328	16		0.7292	0.1 mg/L as N	10/30/18 1530	11/02/18 1000	18	8.22	31	16	291.15	0.64	9.319	0.0456	
Comp 5 (TB-1, TB-2) 100%	94	31248-329	28		1.7311	0.2 mg/L as N	10/30/18 1530	11/02/18 1000	19	8.33	32	28	292.15	0.66	9.321	0.0618	
Laboratory Control	92	31248-298	1.4		0.0283	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	7.86	33	1.4	291.15	0.68	9.324	0.0202	

STUDY: 31248
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: Suspended Particulate Phase
TASK: Elutriate/SPP Ammonia - Unmitigated Sediment
METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) a
 Where: I = Ionic Strength $(19.9273 \times N_{11}) / (1000 - 1.005109 \times N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9)
 FNH3 = fraction of UIA $(+1 / (1 + 10^{(R_{11} + 0.0324 \times (298 - P_{11}) + ((0.0415 \times 1) / P_1))})$
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia				Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R pKa	S FNH3
			Total	Qual	Unionized	QLimit											
CLDS Reference	92	31248-299	1.3		0.0243	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	7.82	31	1.3	291.15	0.64	9.319	0.0187	
Comp 3 (US-1, US-2) 1%	92	31248-300	2.1		0.0446	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	7.88	32	2.1	291.15	0.66	9.321	0.0212	
Comp 3 (US-1, US-2) 10%	92	31248-301	3.9		0.1061	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	7.99	32	3.9	291.15	0.66	9.321	0.0272	
Comp 3 (US-1, US-2) 50%	92	31248-302	12		0.5177	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	8.20	33	12	291.15	0.68	9.324	0.0431	
Comp 3 (US-1, US-2) 100%	72	31248-330	24		1.1307	0.2 mg/L as N	10/29/18 1700	10/30/18 1345	17	8.27	32	24	290.15	0.66	9.321	0.0471	
Comp 3 (US-1, US-2) 100%	92	No survival															
Comp 4 (DS-1, DS-2) 1%	92	31248-304	2.2		0.0470	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	19	7.85	32	2.2	292.15	0.66	9.321	0.0214	
Comp 4 (DS-1, DS-2) 10%	92	31248-305	3.7		0.1106	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	19	8.00	32	3.7	292.15	0.66	9.321	0.0299	
Comp 4 (DS-1, DS-2) 50%	92	31248-306	11		0.5124	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	19	8.20	32	11	292.15	0.66	9.321	0.0466	
Comp 4 (DS-1, DS-2) 100%	92	31248-307	20		1.0800	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	8.30	32	20	291.15	0.66	9.321	0.054	
Comp 5 (TB-1, TB-2) 1%	92	31248-308	2		0.0427	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	7.88	31	2	291.15	0.64	9.319	0.0214	
Comp 5 (TB-1, TB-2) 10%	92	31248-309	4.2		0.1195	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	8.01	32	4.2	291.15	0.66	9.321	0.0284	
Comp 5 (TB-1, TB-2) 50%	92	31248-310	13		0.5892	0.1 mg/L as N	10/30/18 1500	11/02/18 1000	18	8.22	32	13	291.15	0.66	9.321	0.0453	
Comp 5 (TB-1, TB-2) 100%	48	31248-245	29		1.1396	0.5 mg/L as N	10/28/18 1730	10/29/18 1130	15	8.25	31	29	288.15	0.64	9.319	0.0393	
Comp 5 (TB-1, TB-2) 100%	92	No survival															
<u>A. punctulata End</u>																	
Laboratory Control	90	31248-246	0.36		0.0130	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.02	32	0.36	294.15	0.66	9.321	0.0361	
CLDS Reference	90	31248-247	0.3		0.0119	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.06	31	0.3	294.15	0.64	9.319	0.0397	
Comp 1 (V', W') 1%	90	31248-248	1.5		0.0576	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.04	29	1.5	294.15	0.6	9.314	0.0384	
Comp 1 (V', W') 10%	90	31248-249	2.9		0.1514	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.18	29	2.9	294.15	0.6	9.314	0.0522	
Comp 1 (V', W') 50%	90	31248-250	14		1.0548	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.35	29	14	294.15	0.6	9.314	0.0753	
Comp 1 (V', W') 100%	90	31248-251	31		2.7659	0.2 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.43	29	31	294.15	0.6	9.314	0.0892	
Comp 2 (R', S') 1%	90	31248-252	0.77		0.0323	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.08	29	0.77	294.15	0.6	9.314	0.0419	
Comp 2 (R', S') 10%	90	31248-253	3.4		0.1775	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.18	29	3.4	294.15	0.6	9.314	0.0522	
Comp 2 (R', S') 50%	90	31248-254	15		1.1302	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.35	29	15	294.15	0.6	9.314	0.0753	
Comp 2 (R', S') 100%	90	31248-255	29		2.5337	0.2 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.42	29	29	294.15	0.6	9.314	0.0874	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	90	31248-256	1.4		0.0587	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.08	29	1.4	294.15	0.6	9.314	0.0419	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	90	31248-257	1.5		0.0687	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.12	29	1.5	294.15	0.6	9.314	0.0458	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	90	31248-258	5.3		0.3275	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.26	30	5.3	294.15	0.62	9.317	0.0618	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	90	31248-259	11		0.8202	0.1 mg/L as N	10/29/18 1500	10/30/18 1345	21	8.35	31	11	294.15	0.64	9.319	0.0746	
Laboratory Control	74	31248-331	0.9		0.0328	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20.4	8.04	30.3	0.9	293.55	0.62	9.317	0.0365	
CLDS Reference	74	31248-332	0.14		0.0057	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20.5	8.08	28.1	0.14	293.65	0.58	9.312	0.0406	
Comp 3 (US-1, US-2) 1%	74	31248-333	1.5		0.0571	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20	8.07	29.6	1.5	293.15	0.61	9.316	0.038	
Comp 3 (US-1, US-2) 10%	74	31248-334	3.9		0.1705	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.9	8.14	31.2	3.9	293.05	0.64	9.319	0.0437	
Comp 3 (US-1, US-2) 50%	74	31248-335	11		0.6101	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.9	8.25	31.7	11	293.05	0.65	9.321	0.0555	
Comp 3 (US-1, US-2) 100%	74	31248-336	20		1.2963	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.9	8.32	30.9	20	293.05	0.64	9.319	0.0648	
Comp 4 (DS-1, DS-2) 1%	74	31248-337	0.4		0.0183	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20.1	8.15	29.4	0.4	293.25	0.6	9.315	0.0458	
Comp 4 (DS-1, DS-2) 10%	74	31248-338	2.6		0.1277	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20.2	8.18	29.9	2.6	293.35	0.61	9.316	0.0491	
Comp 4 (DS-1, DS-2) 50%	74	31248-339	11		0.7121	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	20.1	8.31	29.7	11	293.25	0.61	9.316	0.0647	
Comp 4 (DS-1, DS-2) 100%	74	31248-340	23		1.6434	0.2 mg/L as N	10/30/18 1645	11/01/18 0900	20	8.36	30	23	293.15	0.62	9.317	0.0715	
Comp 5 (TB-1, TB-2) 1%	74	31248-341	0.79		0.0335	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.8	8.13	31.2	0.79	292.95	0.64	9.319	0.0425	
Comp 5 (TB-1, TB-2) 10%	74	31248-342	3.7		0.1767	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.8	8.18	29.8	3.7	292.95	0.61	9.316	0.0478	
Comp 5 (TB-1, TB-2) 50%	74	31248-343	10		0.6220	0.1 mg/L as N	10/30/18 1645	11/01/18 0900	19.8	8.30	29.2	10	292.95	0.6	9.315	0.0622	
Comp 5 (TB-1, TB-2) 100%	74	31248-344	22		1.5296	0.2 mg/L as N	10/30/18 1645	11/01/18 0900	19.9	8.35	29.8	22	293.05	0.61	9.316	0.0695	

STUDY: 31291
 CLIENT: AECOM
 PROJECT: New Haven Harbor FNP 2018
 ASSAY: Suspended Particulate Phase
 TASK: Elutriate/SPP Ammonia - Mitigated Sediment
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) as
 Where: I = Ionic Strength $(19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.314)
 FNH3 = fraction of UIA $(+1 / (1 + 10^{(R1 + 1 + 0.0324 \cdot (298 - P11)) + ((0.0415 \cdot 1) / P1)}))$
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia			Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R pKa	S FNH3
			Total	Qual	Ionized											
<u>A. bahia Start</u>																
Laboratory Control	0	31291-345	ND	0.0030	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	8.00	31	0.1	292.15	0.64	9.319	0.0301	
CLDS Reference	0	31291-346	ND	0.0028	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	0.1	292.15	0.6	9.314	0.0284	
Comp 1 (V, W) 1%	0	31291-347	ND	0.0027	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.92	29	0.1	293.15	0.6	9.314	0.0273	
Comp 1 (V, W) 10%	0	31291-348	0.2	0.0060	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.96	29	0.2	293.15	0.6	9.314	0.0299	
Comp 1 (V, W) 50%	0	31291-349	0.95	0.0255	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.91	28	0.95	293.15	0.57	9.312	0.0269	
Comp 1 (V, W) 100%	0	31291-350	2	0.0483	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.83	28	2	294.15	0.57	9.312	0.0241	
Comp 2 (R, S) 1%	0	31291-351	ND	0.0028	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.96	29	0.1	292.15	0.6	9.314	0.0278	
Comp 2 (R, S) 10%	0	31291-352	0.34	0.0097	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	0.34	292.15	0.6	9.314	0.0284	
Comp 2 (R, S) 50%	0	31291-353	1.5	0.0375	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.91	28	1.5	292.15	0.57	9.312	0.025	
Comp 2 (R, S) 100%	0	31291-354	3.1	0.0677	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.85	28	3.1	292.15	0.57	9.312	0.0218	
Comp 3 (US-1, US-2) 1%	0	31291-355	ND	0.0031	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.98	29	0.1	293.15	0.6	9.314	0.0313	
Comp 3 (US-1, US-2) 10%	0	31291-356	0.32	0.0098	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.32	293.15	0.6	9.314	0.0306	
Comp 3 (US-1, US-2) 50%	0	31291-357	1.6	0.0418	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.90	29	1.6	293.15	0.6	9.314	0.0261	
Comp 3 (US-1, US-2) 100%	0	31291-358	3.4	0.0750	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.79	28	3.4	294.15	0.57	9.312	0.0221	
Comp 4 (DS-1, DS-2) 1%	0	31291-359	ND	0.0027	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.95	30	0.1	292.15	0.62	9.317	0.027	
Comp 4 (DS-1, DS-2) 10%	0	31291-360	0.31	0.0095	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.31	293.15	0.6	9.314	0.0306	
Comp 4 (DS-1, DS-2) 50%	0	31291-361	1.6	0.0455	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	1.6	292.15	0.6	9.314	0.0284	
Comp 4 (DS-1, DS-2) 100%	0	31291-362	3.3	0.0902	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.95	28	3.3	292.15	0.57	9.312	0.0273	
Comp 5 (TB-1, TB-2) 1%	0	31291-363	ND	0.0030	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	30	0.1	293.15	0.62	9.317	0.0304	
Comp 5 (TB-1, TB-2) 10%	0	31291-364	0.41	0.0114	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.96	29	0.41	292.15	0.6	9.314	0.0278	
Comp 5 (TB-1, TB-2) 50%	0	31291-365	1.4	0.0356	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.92	29	1.4	292.15	0.6	9.314	0.0254	
Comp 5 (TB-1, TB-2) 100%	0	31291-366	2.9	0.0648	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.86	28	2.9	292.15	0.57	9.312	0.0223	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	0	31291-367	ND	0.0029	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.94	29	0.1	293.15	0.6	9.314	0.0286	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	0	31291-368	0.14	0.0043	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.14	293.15	0.6	9.314	0.0306	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	0	31291-369	0.6	0.0197	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.97	29	0.6	294.15	0.6	9.314	0.0329	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	0	31291-370	1.2	0.0426	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	22	7.97	28	1.2	295.15	0.57	9.312	0.0355	
<u>M. beryllina Start</u>																
Laboratory Control	0	31291-345	ND	0.0030	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	8.00	31	0.1	292.15	0.64	9.319	0.0301	
CLDS Reference	0	31291-346	ND	0.0028	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	0.1	292.15	0.6	9.314	0.0284	
Comp 1 (V, W) 1%	0	31291-347	ND	0.0027	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.92	29	0.1	293.15	0.6	9.314	0.0273	
Comp 1 (V, W) 10%	0	31291-348	0.2	0.0060	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.96	29	0.2	293.15	0.6	9.314	0.0299	
Comp 1 (V, W) 50%	0	31291-349	0.95	0.0255	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.91	28	0.95	293.15	0.57	9.312	0.0269	
Comp 1 (V, W) 100%	0	31291-350	2	0.0483	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.83	28	2	294.15	0.57	9.312	0.0241	
Comp 2 (R, S) 1%	0	31291-351	ND	0.0028	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.96	29	0.1	292.15	0.6	9.314	0.0278	
Comp 2 (R, S) 10%	0	31291-352	0.34	0.0097	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	0.34	292.15	0.6	9.314	0.0284	
Comp 2 (R, S) 50%	0	31291-353	1.5	0.0375	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.91	28	1.5	292.15	0.57	9.312	0.025	
Comp 2 (R, S) 100%	0	31291-354	3.1	0.0677	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.85	28	3.1	292.15	0.57	9.312	0.0218	
Comp 3 (US-1, US-2) 1%	0	31291-355	ND	0.0031	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.98	29	0.1	293.15	0.6	9.314	0.0313	
Comp 3 (US-1, US-2) 10%	0	31291-356	0.32	0.0098	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.32	293.15	0.6	9.314	0.0306	
Comp 3 (US-1, US-2) 50%	0	31291-357	1.6	0.0418	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.90	29	1.6	293.15	0.6	9.314	0.0261	
Comp 3 (US-1, US-2) 100%	0	31291-358	3.4	0.0750	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.79	28	3.4	294.15	0.57	9.312	0.0221	
Comp 4 (DS-1, DS-2) 1%	0	31291-359	ND	0.0027	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.95	30	0.1	292.15	0.62	9.317	0.027	
Comp 4 (DS-1, DS-2) 10%	0	31291-360	0.31	0.0095	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.31	293.15	0.6	9.314	0.0306	
Comp 4 (DS-1, DS-2) 50%	0	31291-361	1.6	0.0455	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.97	29	1.6	292.15	0.6	9.314	0.0284	
Comp 4 (DS-1, DS-2) 100%	0	31291-362	3.3	0.0902	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.95	28	3.3	292.15	0.57	9.312	0.0273	
Comp 5 (TB-1, TB-2) 1%	0	31291-363	ND	0.0030	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	30	0.1	293.15	0.62	9.317	0.0304	
Comp 5 (TB-1, TB-2) 10%	0	31291-364	0.41	0.0114	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.96	29	0.41	292.15	0.6	9.314	0.0278	
Comp 5 (TB-1, TB-2) 50%	0	31291-365	1.4	0.0356	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.92	29	1.4	292.15	0.6	9.314	0.0254	

STUDY: 31291
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: Suspended Particulate Phase
TASK: Elutriate/SPP Ammonia - Mitigated Sediment
METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) ar

Where: I = Ionic Strength $(19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.:

FNH3 = fraction of UIA $(+1 / (1 + 10^{(R11 + 0.0324 \cdot (298 - P11)) + ((0.0415 \cdot 1) / P1$

Tot NH3 = total ammonia, or QLimit if ND

pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia				Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R	S FNH3
			Total	Qual	Unionized	QLimit											
Comp 5 (TB-1, TB-2) 100%	0	31291-366	2.9		0.0566	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	19	7.80	28	2.9	292.15	0.57	9.312	0.0195	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	0	31291-367	ND		0.0029	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.94	29	0.1	293.15	0.6	9.314	0.0286	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	0	31291-368	0.14		0.0043	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	20	7.97	29	0.14	293.15	0.6	9.314	0.0306	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	0	31291-369	0.6		0.0197	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	21	7.97	29	0.6	294.15	0.6	9.314	0.0329	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	0	31291-370	1.2		0.0426	0.1 mg/L as N	10/31/18 1700	11/01/18 0900	22	7.97	28	1.2	295.15	0.57	9.312	0.0355	
<u>A. punctulata Start</u>																	
Laboratory Control	0	31291-530	ND		0.0025	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	19	7.91	31	0.1	292.15	0.64	9.319	0.0246	
Comp 1 (V', W') 1%	0	31291-531	ND		0.0026	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.91	32	0.1	293.15	0.66	9.321	0.0263	
Comp 1 (V', W') 10%	0	31291-532	0.2		0.0050	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.89	32	0.2	293.15	0.66	9.321	0.0251	
Comp 1 (V', W') 50%	0	31291-533	0.73		0.0176	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.87	31	0.73	293.15	0.64	9.319	0.0242	
Comp 1 (V', W') 100%	0	31291-534	1.1		0.0223	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.79	30	1.1	293.15	0.62	9.317	0.0203	
Comp 2 (R', S') 1%	0	31291-535	0.11		0.0030	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.92	32	0.11	293.15	0.66	9.321	0.0269	
Comp 2 (R', S') 10%	0	31291-536	0.43		0.0124	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.95	32	0.43	293.15	0.66	9.321	0.0287	
Comp 2 (R', S') 50%	0	31291-537	1.7		0.0427	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.89	32	1.7	293.15	0.66	9.321	0.0251	
Comp 2 (R', S') 100%	0	31291-538	2.4		0.0386	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	19	7.72	30	2.4	292.15	0.62	9.317	0.0161	
Comp 3 (US-1, US-2) 1%	0	31291-539	ND		0.0031	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.99	32	0.1	293.15	0.66	9.321	0.0314	
Comp 3 (US-1, US-2) 10%	0	31291-540	0.14		0.0043	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.98	32	0.14	293.15	0.66	9.321	0.0307	
Comp 3 (US-1, US-2) 50%	0	31291-541	0.69		0.0223	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	8.00	31	0.69	293.15	0.64	9.319	0.0323	
Comp 3 (US-1, US-2) 100%	0	31291-542	1.4		0.0465	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	8.01	30	1.4	293.15	0.62	9.317	0.0332	
Comp 4 (DS-1, DS-2) 1%	0	31291-543	0.11		0.0032	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.95	31	0.11	293.15	0.64	9.319	0.0289	
Comp 4 (DS-1, DS-2) 10%	0	31291-544	0.28		0.0085	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.97	31	0.28	293.15	0.64	9.319	0.0302	
Comp 4 (DS-1, DS-2) 50%	0	31291-545	1.2		0.0379	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.99	31	1.2	293.15	0.64	9.319	0.0316	
Comp 4 (DS-1, DS-2) 100%	0	31291-546	2.3		0.0764	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	8.01	30	2.3	293.15	0.62	9.317	0.0332	
Comp 5 (TB-1, TB-2) 1%	0	31291-547	ND		0.0028	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.93	31	0.1	293.15	0.64	9.319	0.0276	
Comp 5 (TB-1, TB-2) 10%	0	31291-548	0.34		0.0093	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.93	32	0.34	293.15	0.66	9.321	0.0275	
Comp 5 (TB-1, TB-2) 50%	0	31291-549	1.3		0.0299	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.85	32	1.3	293.15	0.66	9.321	0.023	
Comp 5 (TB-1, TB-2) 100%	0	31291-550	2.6		0.0466	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.74	32	2.6	293.15	0.66	9.321	0.0179	
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	0	31291-551	ND		0.0026	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.91	32	0.1	293.15	0.66	9.321	0.0263	
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	0	31291-552	0.24		0.0074	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.98	32	0.24	293.15	0.66	9.321	0.0307	
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	0	31291-553	1		0.0276	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.93	31	1	293.15	0.64	9.319	0.0276	
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	0	31291-554	1.7		0.0422	0.1 mg/L as N	11/21/18 1300	11/27/18 1315	20	7.88	30	1.7	293.15	0.62	9.317	0.0248	

STUDY: 31291
 CLIENT: AECOM
 PROJECT: New Haven Harbor FNP 2018
 ASSAY: Suspended Particulate Phase
 TASK: Elutriate/SPP Ammonia - Mitigated Sediment
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) ar

Where: I = Ionic Strength $(19.9273 \times N_{11}) / (1000 - 1.005109 \times N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9).

FNH3 = fraction of UIA $(+1 / (1 + 10^{(R1 + 1 + 0.0324 \times (298 - P11)) + ((0.0415 \times 1) / P1))$

Tot NH3 = total ammonia, or QLimit if ND

pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia				Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R pKa	S FNH3
			Total	Qual	Unionized	QLimit										
<u>A. bahia</u> End																
Laboratory Control	94	31291-397	1.4		0.0311	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.84	34	1.4	293.15	0.7	9.326	0.0222
CLDS Reference	94	31291-398	1.7		0.0296	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.73	33	1.7	293.15	0.68	9.324	0.0174
Comp 1 (V, W) 1%	94	31291-399	1.7		0.0319	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.76	32	1.7	293.15	0.66	9.321	0.0188
Comp 1 (V, W) 10%	94	31291-400 ^a							20	7.82	32					
Comp 1 (V, W) 50%	94	31291-401 ^a							20	7.80	31					
Comp 1 (V, W) 100%	94	31291-402	2.9		0.0630	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.82	30	2.9	293.15	0.62	9.317	0.0217
Comp 2 (R, S) 1%	94	31291-403	1.8		0.0259	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.64	31	1.8	293.15	0.64	9.319	0.0144
Comp 2 (R, S) 10%	94	31291-404	1.9		0.0383	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.79	31	1.9	293.15	0.64	9.319	0.0202
Comp 2 (R, S) 50%	94	31291-405	2.5		0.0482	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.77	31	2.5	293.15	0.64	9.319	0.0193
Comp 2 (R, S) 100%	94	31291-406	3.7		0.0768	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.80	30	3.7	293.15	0.62	9.317	0.0208
Comp 3 (US-1, US-2) 1%	94	31291-407	1.8		0.0290	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.69	31	1.8	293.15	0.64	9.319	0.0161
Comp 3 (US-1, US-2) 10%	94	31291-408	1.8		0.0363	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.79	31	1.8	293.15	0.64	9.319	0.0202
Comp 3 (US-1, US-2) 50%	94	31291-409	2.6		0.0525	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.79	31	2.6	293.15	0.64	9.319	0.0202
Comp 3 (US-1, US-2) 100%	94	31291-410	3.5		0.0777	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.83	30	3.5	293.15	0.62	9.317	0.0222
Comp 4 (DS-1, DS-2) 1%	94	31291-411	1.7		0.0402	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.86	31	1.7	293.15	0.64	9.319	0.0236
Comp 4 (DS-1, DS-2) 10%	94	31291-412	2		0.0395	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.78	31	2	293.15	0.64	9.319	0.0197
Comp 4 (DS-1, DS-2) 50%	94	31291-413	2.6		0.0564	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.82	30	2.6	293.15	0.62	9.317	0.0217
Comp 4 (DS-1, DS-2) 100%	94	31291-414	3.5		0.0889	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.89	30	3.5	293.15	0.62	9.317	0.0254
Comp 5 (TB-1, TB-2) 1%	94	31291-415	1.6		0.0300	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	19	7.79	31	1.6	292.15	0.64	9.319	0.0188
Comp 5 (TB-1, TB-2) 10%	94	31291-416	1.9		0.0410	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.82	31	1.9	293.15	0.64	9.319	0.0216
Comp 5 (TB-1, TB-2) 50%	94	31291-417	2.4		0.0593	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.88	31	2.4	293.15	0.64	9.319	0.0247
Comp 5 (TB-1, TB-2) 100%	94	31291-418	3		0.0797	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.91	30	3	293.15	0.62	9.317	0.0266
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	94	31291-419	1.9		0.0360	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.76	30	1.9	293.15	0.62	9.317	0.019
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	94	31291-420	2		0.0415	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.80	30	2	293.15	0.62	9.317	0.0208
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	94	31291-421	2.2		0.0478	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.82	30	2.2	293.15	0.62	9.317	0.0217
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	94	31291-422	2.6		0.0621	0.1 mg/L as N	11/04/18 1600	11/05/18 1330	20	7.86	29	2.6	293.15	0.6	9.314	0.0239
<u>M. beryllina</u> End																
Laboratory Control	93	31291-371	2		0.0350	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.73	32	2	293.15	0.66	9.321	0.0175
CLDS Reference	93	31291-372	2.2		0.0472	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.82	32	2.2	293.15	0.66	9.321	0.0215
Comp 1 (V, W) 1%	93	31291-373	2.5		0.0516	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.80	31	2.5	293.15	0.64	9.319	0.0206
Comp 1 (V, W) 10%	93	31291-374	2.4		0.0554	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.85	31	2.4	293.15	0.64	9.319	0.0231
Comp 1 (V, W) 50%	93	31291-375	2.7		0.0638	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.86	31	2.7	293.15	0.64	9.319	0.0236
Comp 1 (V, W) 100%	93	31291-376	2.9		0.0689	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.86	30	2.9	293.15	0.62	9.317	0.0238
Comp 2 (R, S) 1%	93	31291-377	2.8		0.0502	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.74	32	2.8	293.15	0.66	9.321	0.0179
Comp 2 (R, S) 10%	93	31291-378	2.5		0.0562	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.84	32	2.5	293.15	0.66	9.321	0.0225
Comp 2 (R, S) 50%	93	31291-379	2.9		0.0713	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.88	32	2.9	293.15	0.66	9.321	0.0246
Comp 2 (R, S) 100%	93	31291-380	3.3		0.0887	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.92	32	3.3	293.15	0.66	9.321	0.0269
Comp 3 (US-1, US-2) 1%	93	31291-381	2.2		0.0434	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.78	31	2.2	293.15	0.64	9.319	0.0197
Comp 3 (US-1, US-2) 10%	93	31291-382	2.4		0.0542	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.84	31	2.4	293.15	0.64	9.319	0.0226
Comp 3 (US-1, US-2) 50%	93	31291-383	3		0.0662	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.83	31	3	293.15	0.64	9.319	0.0221
Comp 3 (US-1, US-2) 100%	93	31291-384	3.7		0.0840	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.84	30	3.7	293.15	0.62	9.317	0.0227
Comp 4 (DS-1, DS-2) 1%	93	31291-385	2.1		0.0370	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.73	31	2.1	293.15	0.64	9.319	0.0176
Comp 4 (DS-1, DS-2) 10%	93	31291-386	2.1		0.0464	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.83	31	2.1	293.15	0.64	9.319	0.0221
Comp 4 (DS-1, DS-2) 50%	93	31291-387	2.8		0.0677	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.87	31	2.8	293.15	0.64	9.319	0.0242
Comp 4 (DS-1, DS-2) 100%	93	31291-388	3.5		0.0889	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.89	30	3.5	293.15	0.62	9.317	0.0254
Comp 5 (TB-1, TB-2) 1%	93	31291-389	2.1		0.0379	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.74	31	2.1	293.15	0.64	9.319	0.018
Comp 5 (TB-1, TB-2) 10%	93	31291-390	2.6		0.0490	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.76	31	2.6	293.15	0.64	9.319	0.0189

STUDY: 31291
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: Suspended Particulate Phase
TASK: Elutriate/SPP Ammonia - Mitigated Sediment
METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) ar

Where: I = Ionic Strength $(19.9273 \times N_{11}) / (1000 - 1.005109 \times N_{11})$

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.:

FNH3 = fraction of UIA $(+1 / (1 + 10^{(R11 + 0.0324 \times (298 - P11)) + ((0.0415 \times 1) / P1$

Tot NH3 = total ammonia, or QLimit if ND

pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia			Units	Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK)	Q	R	S FNH3
			Total	Qual	Unionized											
Comp 5 (TB-1, TB-2) 50%	93	31291-391	2.7		0.0667	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.88	31	2.7	293.15	0.64	9.319	0.0247
Comp 5 (TB-1, TB-2) 100%	93	31291-392	3.2		0.0795	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.88	30	3.2	293.15	0.62	9.317	0.0248
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	93	31291-393	2.1		0.0453	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.82	31	2.1	293.15	0.64	9.319	0.0216
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	93	31291-394	2.2		0.0454	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.80	31	2.2	293.15	0.64	9.319	0.0206
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	93	31291-395	2.3		0.0488	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.81	30	2.3	293.15	0.62	9.317	0.0212
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	93	31291-396	2.6		0.0555	0.1 mg/L as N	11/04/18 1600	11/05/18 1030	20	7.81	29	2.6	293.15	0.6	9.314	0.0213
<u>A. punctulata End</u>																
Laboratory Control	68	31291-555	0.15		0.0048	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.00	33	0.15	293.15	0.68	9.324	0.032
Comp 1 (V', W') 1%	68	31291-556	0.27		0.0097	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.02	33	0.27	294.15	0.68	9.324	0.0359
Comp 1 (V', W') 10%	68	31291-557	0.48		0.0180	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.04	33	0.48	294.15	0.68	9.324	0.0375
Comp 1 (V', W') 50%	68	31291-558	0.85		0.0326	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.05	33	0.85	294.15	0.68	9.324	0.0384
Comp 1 (V', W') 100%	68	31291-559	1.2		0.0456	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.04	31	1.2	294.15	0.64	9.319	0.038
Comp 2 (R', S') 1%	68	31291-560	0.2		0.0080	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.07	33	0.2	294.15	0.68	9.324	0.0401
Comp 2 (R', S') 10%	68	31291-561	0.39		0.0160	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.08	33	0.39	294.15	0.68	9.324	0.041
Comp 2 (R', S') 50%	68	31291-562	0.98		0.0420	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.10	33	0.98	294.15	0.68	9.324	0.0429
Comp 2 (R', S') 100%	68	31291-563	2.4		0.1105	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.13	32	2.4	294.15	0.66	9.321	0.046
Comp 3 (US-1, US-2) 1%	68	31291-564	0.2		0.0075	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.07	33	0.2	293.15	0.68	9.324	0.0373
Comp 3 (US-1, US-2) 10%	68	31291-565	0.45		0.0175	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.09	34	0.45	293.15	0.7	9.326	0.0388
Comp 3 (US-1, US-2) 50%	68	31291-566	0.89		0.0355	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.10	33	0.89	293.15	0.68	9.324	0.0399
Comp 3 (US-1, US-2) 100%	68	31291-567	1.4		0.0578	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.11	31	1.4	293.15	0.64	9.319	0.0413
Comp 4 (DS-1, DS-2) 1%	68	31291-568	0.52		0.0202	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.09	34	0.52	293.15	0.7	9.326	0.0388
Comp 4 (DS-1, DS-2) 10%	68	31291-569	0.58		0.0225	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.09	34	0.58	293.15	0.7	9.326	0.0388
Comp 4 (DS-1, DS-2) 50%	68	31291-570	1.3		0.0519	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.10	33	1.3	293.15	0.68	9.324	0.0399
Comp 4 (DS-1, DS-2) 100%	68	31291-571	2.2		0.0986	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.15	32	2.2	293.15	0.66	9.321	0.0448
Comp 5 (TB-1, TB-2) 1%	68	31291-572	0.12		0.0038	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	7.99	32	0.12	293.15	0.66	9.321	0.0314
Comp 5 (TB-1, TB-2) 10%	68	31291-573	0.41		0.0153	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.07	33	0.41	293.15	0.68	9.324	0.0373
Comp 5 (TB-1, TB-2) 50%	68	31291-574	1.4		0.0571	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.11	33	1.4	293.15	0.68	9.324	0.0408
Comp 5 (TB-1, TB-2) 100%	68	31291-575	2.7		0.1184	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.14	32	2.7	293.15	0.66	9.321	0.0438
Comp 6 (CAD-1, CAD-2, CAD-3) 1%	68	31291-576	0.18		0.0070	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.09	33	0.18	293.15	0.68	9.324	0.039
Comp 6 (CAD-1, CAD-2, CAD-3) 10%	68	31291-577	0.28		0.0109	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.09	33	0.28	293.15	0.68	9.324	0.039
Comp 6 (CAD-1, CAD-2, CAD-3) 50%	68	31291-578	0.89		0.0357	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	20	8.10	32	0.89	293.15	0.66	9.321	0.0401
Comp 6 (CAD-1, CAD-2, CAD-3) 100%	68	31291-579	1.8		0.0820	0.1 mg/L as N	11/24/18 1200	11/27/18 1315	21	8.12	30	1.8	294.15	0.62	9.317	0.0455

Notes:

^a Bottles were pulled for analysis, but data are missing.

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	NA
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	NA
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	NA
15. Were the SRM/CRM analyses within acceptance criteria?	NA
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	NA
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	NA
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	NA
19. Were surrogate recoveries within the required acceptance criteria?	NA
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	Yes, except as noted for temperature and salinity
22. Were the test-specific age requirements met for each test species?	Yes
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	Yes
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	Yes
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	Yes

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species	Yes, except as noted for temperature and salinity	Sections 3.3, 3.4 and 3.5, Tables 6 and 7, and Appendix A	Data Package
Test species age	Age/health within guidelines for each species (Appendix V)	Yes		Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No	Yes		Data Package (separate cover)
Water column toxicity test: Control mortality Control abnormality	$\leq 10\%$ mean $\leq 30\%$ mussel/oyster; $< 40\%$ clam larvae, $< 30\%$ sea urchin larvae	Yes		Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	$\leq 10\%$ mean (no chamber $> 20\%$) See EPA (1994a) Section 9; Table 11.3	NA		

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

ASSAY REVIEW CHECKLIST

STUDY#: 31248 & 31291
CLIENT: AECOM
PROJECT: New Haven Harbor 2018
ASSAY: Suspended Particulate Phase Evaluation

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	12/13/18	BG	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)	↓	↓	
Bench Sheets Complete (dates, times, initials, etc...)	↓	↓	
Water Quality Data Complete	↓	↓	
Weights Reported	↓	↓	
Assay Acceptability Review	↓	↓	

Technical Report Review	Date	Initials	Comments
Statistical Analysis			
Survival / Dev	11/26/18	MR	
Chemical	NA		
Statistical Analysis Reviewed	11/29/18	LF	
Data Acceptability Review	11/29/18	MR	
Support Documentation			
Temperature Data Logger	NA		
Daily WQ Data	12/21/18	MR	
Overlying and/or Pore Water Chemistry NH ₃	12/21/18	MR	QA: LF 12/28/18
Other Chemical Analysis Data	NA		
Draft Report	12/22/18	MR	Revised per AECOM Comments 1/14/19
Report Reviewed	12/21/18	LF	Revisions reviewed 1/8/19
QA Audit/Review Complete			
Report Printed - PDF	12/28/18	MR	Final draft 1/8/19 (MR)
Report E-mailed / Faxed	12/28/18	MR	Final draft 1/8/19 (MR)
Report Logged Out	↓	↓	↓

Appendix D.2: 10-Day Whole Sediment Bioassay (10 Day Solid Phase Evaluation)

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation
Improvement Project, New Haven, Connecticut**

December 20, 2018

10-Day Bioassay Report

**TOXICOLOGICAL EVALUATION
OF A PROPOSED DREDGE SEDIMENT:**

**New Haven Harbor Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut**

**New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109**

10 Day Solid Phase Evaluation

Prepared For:

AECOM
250 Apollo Drive
Chelmsford, Massachusetts 01824

Prepared By:

EnviroSystems, an affiliate of Enthalpy Analytical LLC
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Hampton, New Hampshire 03842

EnviroSystems, Inc. Master Reference 31242
Specific Studies 31244 & 31245
Report Issue Date: December 18, 2018
Assay Start: November 2018

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LABORATORY STANDARDS STATEMENT

This study was performed by EnviroSystems, an affiliate of Enthalpy Analytical LLC, at its facility in Hampton, New Hampshire. EnviroSystems' laboratory is accredited by the State of New Hampshire under the National Environmental Laboratory Accreditation (NELAC) program. Additionally, ESI is accredited under the Department of Defense (DoD) ELAP program, ISO/IEC 17025:2005, Certificate Number L2340. All testing conducted by EnviroSystems as part of this program was compliant with NELAC guidelines and standards. Additionally, this study was conducted in accordance with guidelines presented in the 2004 version of the New England District's *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal In New England Waters* (RIM) with relevant updates. Any deviations from specific elements of the RIM are detailed in the Protocol Deviation section of this report.



For EnviroSystems, Inc.

Kirk Cram
Laboratory Director

December 18, 2018

Date

TOXICOLOGICAL EVALUATION OF A PROPOSED DREDGE SEDIMENT:

New Haven Harbor 2018 Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut

New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109

10 Day Solid Phase Evaluation

1.0 INTRODUCTION

As part of a comprehensive plan to reduce adverse environmental impacts of ocean dumping, Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 specifies that all sediments to be discharged into ocean waters must be evaluated to define their potential impact on existing benthic communities. The United States Environmental Protection Agency (US EPA) has determined that the most effective means to make such an assessment is through the use of bioassay tests, which provide a relatively direct estimate of potential impact.

This project was designed to evaluate the potential toxicity of sediments from the area of dredging proposed for the New Haven Harbor 2018 Federal Navigation Project (FNP) located in New Haven, Connecticut. Placement of dredge materials is proposed at the Central Long Island Sound Disposal Site (CLDS).

Testing involved conduct of acute exposure 10 day solid phase assays using the mysid, *Americamysis bahia*, and the amphipod, *Leptocheirus plumulosus*. Testing followed procedures established by the US EPA and the United States Army Corps of Engineers (US ACE) for testing of dredged material. Procedures are presented in *Evaluation of Dredged Material Proposed for Ocean Disposal* (US EPA, US ACE 1991), *Evaluation of Dredged Material Proposed for Discharge in Waters of the US - Testing Manual* (US EPA, US ACE 1998), and the *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (US EPA, CENAE, 2004). All biological testing and chemical analyses completed in support of the 10 day solid phase evaluation were performed at EnviroSystems (ESI), an affiliate of Enthalpy Analytical LLC, Hampton, New Hampshire.

2.0 MATERIALS AND METHODS

2.1 Sample Collection, Preservation and Storage

Sediment cores for toxicological analysis were collected by the US ACE New England District (CENAE) using vibracoring equipment from locations identified in the dredge footprint specified in the project Work Plan (AECOM, 2018). Sediment samples were received from AECOM, Chelmsford, Massachusetts under chain of custody in 3.5 gallon polyethylene buckets and were composited based on the compositing scheme outlined in the Work Plan. Reference sediment samples were collected by the AECOM field team from the CLDS. Upon arrival at the laboratory, all samples received an internal sample control number and were logged into the project sample control system. Prior to testing, samples were placed in a secure refrigerator and stored at a temperature of $4 \pm 2^\circ\text{C}$ until test preparation. Sample identification, collection and receipt information is summarized in Table 1. Sample compositing information is provided in Table 2.

New Haven Harbor 2018 FNP Tier III Sediment Evaluation. 10 day Solid Phase Evaluation.
US ACE New England District. ESI Studies 31244 & 31245. November 2018.

Sediment for the laboratory control treatment was collected from the Hampton Estuary, Hampton, New Hampshire. The area is not known to receive any direct industrial inputs and has been used as laboratory reference sediment in the testing of marine sediments for over 30 years. Overlying seawater is pumped in daily from the Hampton Estuary and stored in holding tanks. Seawater is obtained through a filter system located on the bottom of the estuary at a point approximately 1 mile from the open ocean. Laboratory water is aerated through the collection system and in individual storage containers and test chambers. Water from the estuary has been used for the culture and maintenance of test organisms at ESI since 1978. The Hampton Estuary laboratory control was included to verify the health of the test organisms, and as a relative benchmark for reference site toxicity.

2.2 Sediment Preparation

Prior to testing, samples were press sieved through a 2-mm stainless steel screen for both *A. bahia* and *L. plumulosus* to remove large stones, sticks, roots, man-made material and indigenous organisms. Once sieved, individual composites were loaded into clean HDPE vessels to begin the ammonia mitigation phase based on the Ferretti (Ferretti et al, 2000) method. Sediments were loaded to a depth of 7-11mm in the vessels and clean overlying water was added in a 1:3 ratio of sediment to water. A thin piece of plastic was placed over the sediment prior to adding the overlying water in an effort to keep the sediment from becoming suspended during the addition. The thin piece of plastic was slowly removed after the overlying water was added. Each mitigation vessel was aerated and the temperature, pH, specific conductivity, salinity and dissolved oxygen were recorded daily prior to siphoning off the overlying water. A small sub-sample from each composite was removed daily and centrifuged to extract pore water. Temperature, pH and salinity of the extract were recorded and the pore water was subsequently analyzed for total ammonia. These values were used to calculate the pore water unionized ammonia levels daily. If the daily value of any composite was below the target threshold of 0.8 mg/L unionized ammonia (AECOM, 2018), two additional sub-samples were collected and analyzed to confirm the ammonia levels. Once below the unionized ammonia threshold for a 24-hour period, composites were removed from their mitigation vessels and placed in clean HDPE 1-gallon buckets until all samples were ready to be loaded into test chambers for assay initiation. Test chambers were loaded 24-hours prior to assay initiation to allow sediments and overlying water time to settle.

2.3 Bioassay Procedures

2.3.1 *A. bahia* 10 Day Solid Phase Evaluation

The 10 day exposure toxicity test was completed using *A. bahia* obtained from Aquatic Research Organisms (ARO) of Hampton, New Hampshire. Prior to use, test organisms were held for a minimum of 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. *A. bahia* used in the assay were ≤ 5 days old at the start of the test.

The assay was conducted in a static renewal mode. Test chambers were 1 liter beakers modified for static renewal testing. Each beaker contained approximately 175 mL of sediment and was filled with 725 mL of seawater. A total of 20 organisms were randomly selected from the lot received and added to each replicate by groups of 10. All treatment groups included 5 replicates. Each day during the test, chambers received 1 volume of new seawater having similar salinity and temperature as the overlying water in the vessels. This results in an approximate 50% renewal of overlying water. Water temperature was $20 \pm 1^\circ\text{C}$, and the salinity regimen was established at $30 \pm 2\text{‰}$. The photoperiod was set at 16:8 hours light:dark.

Dissolved oxygen, pH, salinity, specific conductivity and temperature were measured daily in one replicate of each treatment and in all replicates on days 0 and 10 using a YSI multi-parameter probe that captures the data electronically following a pre-determined sample reading order. Data are downloaded using YSI Data Manager software and formatted into tables; there are no raw data sheets. Ammonia levels were measured in the overlying water of a representative test chamber on days 0, 3 and 10. All test

chambers were aerated throughout the assay and dissolved oxygen levels were maintained at ≥ 6.0 mg/L per ESI's protocol ($\geq 40\%$ saturation following RIM protocol). Water quality measurements were completed prior to water renewals. Test chambers were observed daily to ensure proper aeration and to note any test or treatment abnormalities. Any such observations were recorded on data sheets. Mysids were fed ≤ 24 hour old *Artemia* nauplii twice daily. After 10 days of exposure, the organisms were recovered for survival counts.

2.3.2 *L. plumulosus* 10 Day Solid Phase Evaluation

L. plumulosus were obtained from cultures maintained by ARO. Prior to use, test organisms were held for a minimum of 2 hours under temperature, salinity, and photoperiod conditions similar to those used in the assay. *L. plumulosus* were 2-4 mm in size and of mixed sex.

The assay was conducted in a static renewal mode. Test chambers were 1 liter beakers modified for static renewal testing. Each beaker contained approximately 175 mL of sediment and was filled with 725 mL of seawater. A total of 20 organisms were randomly selected from the lot received and added to each replicate by groups of 10. Each treatment group included 5 replicates and a surrogate test chamber that was used to obtain water qualities during the assay without disturbing the test animals. The surrogate chamber was treated the same as actual test chambers with the addition of animals, but was not used to determine endpoint data. Each day during the test, chambers received 1 volume of new seawater having similar salinity and temperature as the overlying water in the vessels. This results in an approximate 50% renewal of overlying water. Water temperature was 20 ± 1 °C, and the salinity regimen was established at 20 ± 2 ‰. The photoperiod was set at 16:8 hours light:dark.

Dissolved oxygen, pH, salinity, specific conductivity and temperature were measured daily in the surrogate replicate of each treatment and in all replicates on days 0 and 10 using a YSI multi-parameter probe that captures the data electronically following a pre-determined sample reading order. Data are downloaded using YSI Data Manager software and formatted into tables; there are no raw data sheets. Ammonia levels were measured in the overlying and pore water of the surrogate test chamber on days 0, 3 and 10. All test chambers were aerated throughout the assay and dissolved oxygen levels were maintained at ≥ 6.0 mg/L per ESI's protocol ($\geq 40\%$ saturation following RIM protocol). Water quality measurements were completed prior to water renewals. Test chambers were observed daily to ensure proper aeration and to note any test or treatment abnormalities. Any such observations were recorded on data sheets. After 10 days of exposure, the organisms were recovered for survival counts.

2.4 Statistical Analysis

Survival data were analyzed using CETIS™ (Comprehensive Environmental Toxicity Information System) v1.9.3.0 software to determine significant differences between the project sediments and the CLDS reference site. Survival data were evaluated to determine homogeneity of sample variances and normality of distribution using appropriate statistics. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were made using one-way unpaired t-tests (equal or unequal variance t two-sample tests) or other appropriate statistical test as needed. Statistical difference was evaluated at $\alpha = 0.05$.

2.5 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Summaries of acute exposure reference toxicant assays conducted in support of this study are provided in Table 3.

3.0 RESULTS AND DISCUSSION

Table 4 provides a summary of assay acceptability and laboratory control performance. Tables 5 and 6 summarize the results of the statistical analysis for *A. bahia* and *L. plumulosus*, respectively. Tables 7 through 9 summarize water quality data collected during the *A. bahia* and *L. plumulosus* assays. Laboratory bench sheets, water quality data, and associated statistical support data are included in Appendix A.

3.1 *A. bahia* 10 Day Solid Phase Evaluation

Mean mysid survival in the laboratory control sediment was 98% with a coefficient of variation (CV) of 5%. Assay protocol requires that mean control survival be $\geq 90\%$. Based on this, the mysids were considered healthy and the overlying water was determined to have had no adverse impact on the outcome of the assay. Mean mysid survival in the CLDS reference sediment was 63% with an associated CV of 65%. See Section 3.3 for a discussion of this out of control event for the CLDS reference sediment.

Mean mysid survival in the site composites ranged from 91% (Composites 3 and 4) to 96% (Composite 6). The statistical analyses show that there were no negative effects on mysid survival following exposure to any of the site composite samples as compared the CLDS reference sediment.

Temperature data collected during the daily water quality observations documented a mean value of 20.9°C with a range of 19.7 to 21.7°C. Confirmation temperature data collected on an hourly basis from a data logger documented a mean value of 21.0°C with a range of 19.8 to 21.8°C. Salinity levels ranged from 24.6 to 32.9‰ with a mean value of 28.3‰. Test acceptability criteria requires a mean temperature of $20 \pm 1^\circ\text{C}$ with maximum temporary fluctuations of $20 \pm 3^\circ\text{C}$, and salinity within a range of $30 \pm 2\text{‰}$. Please see section 3.3 for a discussion of the salinity deviations.

3.2 *L. plumulosus* 10 Day Solid Phase Evaluation

Mean amphipod survival in the laboratory control sediment was 98% with a CV of 3%. Assay protocol requires that mean control survival be $\geq 90\%$. Based on this, the amphipods were considered healthy and the overlying water was determined to have had no adverse impact on the outcome of the assay. Mean amphipod survival in the CLDS reference sediments was 79% with an associated CV of 46%. See Section 3.3 for a discussion of this out of control event for the CLDS reference sediment.

Mean amphipod survival in the site composites ranged from 92% (Composite 4) to 99% (Composite 5). The statistical analyses show that there were no negative effects on amphipod survival following exposure to any of the site composite samples as compared the CLDS reference sediment.

Temperature data collected during the daily water quality observations documented a mean value of 20.9°C with a range of 20.0 to 21.7°C. Confirmation temperature data collected on an hourly basis from a data logger documented a mean value of 21.0°C with a range of 19.8 to 21.8°C. Salinity levels ranged from 17.2 to 23.6‰ with a mean value of 19.3‰. Test acceptability criteria requires a mean temperature of $20 \pm 1^\circ\text{C}$ with maximum temporary fluctuations of $20 \pm 3^\circ\text{C}$, and salinity within a range of $20 \pm 2\text{‰}$. Please see section 3.3 for a discussion of the salinity deviations.

3.3 Out of Control Event and Protocol Deviations

Review of data collected as part of the biological evaluation documented the following out of control event and deviations from the protocol and/or ESI's Standard Operating Procedures:

The CLDS reference sediment performed poorly in both the mysid and amphipod assays, achieving only 63% and 79% survival, respectively. The laboratory control and site composites achieved $\geq 90\%$

survival for both species, indicating that organisms were healthy. None of the site composites were determined to be significantly impacted as compared with the reference sediment, given this performance. Test parameters were largely within their targeted ranges, except as noted, and there were no indications that there were any issues with assay conduct. The calculated unionized ammonia levels for the CLDS reference were well below the threshold of 0.8 mg/L in both the pre-assay pore water sample and during assay conduct. There were some juvenile polychaetes found in replicates D and E of the CLDS reference sediment upon recovery of the amphipod assay. It cannot be determined if their presence adversely impacted amphipod survival in those replicates, however it is plausible that they were a stressor. All test sediments are sieved prior to use and any native organisms present in the reference sediment would have been small enough to pass through this process. Predation within these replicates is possible but the size of the polychaetes makes it unlikely. Furthermore, none of these polychaetes were recovered from the mysid reference sediment. Although there are no criteria that the reference sediment must meet, this is considered an out of control event and remains an uncertainty.

Protocol requires that the *A. bahia* and *L. plumulosus* assays be conducted at $30\pm 2\%$ and $20\pm 2\%$, respectively, and salinity values recorded on day 9 of the *A. bahia* assay and day 10 of both assays fell below their acceptable ranges to as low as 24.6‰ (*A. bahia*) and 17.2‰ (*L. plumulosus*). The analyst indicated they were experiencing low readings with one of the salinity probes and it was subsequently recalibrated. Following recalibration, measurements were generally within range however the out of range readings for this project were not able to be recaptured and may be suspect. There were also sporadic readings on days 3 (*L. plumulosus*) and 7 (both species) that exceeded the target range, however these are isolated instances and not believed to be related to any systemic causes. Mean salinity for the assays (28.3‰ for *A. bahia* and 19.3‰ for *L. plumulosus*) were within their target ranges and control survival met acceptance criteria demonstrating that the test organisms are tolerant of salinities within the ranges measured. It is the opinion of ESI's technical manager that these deviations had no adverse impact on the outcome of either assay.

The dissolved oxygen in the *L. plumulosus* assay dropped to a low of 4.9 mg/L, which is below the threshold outlined in ESI's standard operating procedures, however the minimum percent dissolved oxygen (62%) remained above the RIM's threshold of $\geq 40\%$. This was an isolated excursion that occurred in the surrogate vessel of the laboratory control on day 1, which may have resulted if an airline fell out of the test vessel and was replaced on discovery. It is the opinion of ESI's technical manager that this deviation did not adversely affect the outcome of the assay.

Due to technician oversight, no water daily water quality measurements were collected for replicates A through E for the laboratory control or the CLDS reference on day 10 of the *L. plumulosus* assay, however there were measurements collected from the surrogate vessels. While these represent data gaps, it is the opinion of ESI's technical manager that these deviations had no adverse affect on the outcome of the assay.

4.0 SUMMARY

This program utilized protocols developed by the US EPA and the CENAE to assess the potential impact the proposed dredge material collected for the New Haven Harbor 2018 FNP would have on the marine environment. Review of the data presented in Tables 5 and 6 documents that there were no significant impacts on survival for either organism tested as compared with the CLDS reference sediment. Although survival in the CLDS reference for both organisms was low, all of the site composites achieved $\geq 90\%$ survival for both species.

5.0 REFERENCES

- AECOM. 2018. *Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project: Project Work Plan, New Haven, Connecticut [Work Plan]*. Chelmsford, Massachusetts. October 2018.
- Ferretti, JA, DF Calesso, T Hermon. 2000. *Evaluation of Methods to Remove Ammonia Interference in Marine Sediment Toxicity Tests*. Environ Toxicol Chem 19 (8):1935-1941.
- US EPA, US ACE. 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual*. EPA-503/8-91/001. 204 pages.
- US EPA, US ACE. 1998. *Evaluation of Dredged Material Proposed for Discharge in Waters of the US - Testing Manual*. EPA-823-B-98-004, February 1998.
- US EPA Region I, Corps of Engineers, New England District. 2004. *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters*. September 2004.

Table 1. Sample Collection and Receipt Information. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Station ID ^a	ESI Code	Sample Type	Matrix	Collection		Receipt	
				Date	Time	Date	Time
Comp V',W' Station V'	31242-001	Site	Solid	10/23/18	1125	10/24/18	1015
Comp V',W' Station W'	31242-002	Site	Solid	10/23/18	1125	10/24/18	1015
Comp R',S' Station R'	31242-003	Site	Solid	10/23/18	1215	10/24/18	1015
Comp R',S' Station S'	31242-004	Site	Solid	10/23/18	1215	10/24/18	1015
Comp CAD 1-3 Station CAD 1	31242-005	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD 2	31242-006	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD 3	31242-007	Site	Solid	10/23/18	1527	10/24/18	1015
NHH-CLDS	31242-008	Reference	Solid	10/23/18	1028	10/24/18	1015
Comp TB-1-2, Station TB-1	31242-010	Site	Solid	10/24/18	1146	10/25/18	0835
Comp TB-1-2, Station TB-2	31242-011	Site	Solid	10/24/18	1146	10/25/18	0835
Comp DS-1-2, Station DS-1	31242-012	Site	Solid	10/24/18	1006	10/25/18	0835
Comp DS-1-2, Station DS-2	31242-013	Site	Solid	10/24/18	1006	10/25/18	0835
Comp US-1-2, Station US-1	31242-019	Site	Solid	10/25/18	1023	10/25/18	1820
Comp US-1-2, Station US-2	31242-020	Site	Solid	10/25/18	1023	10/25/18	1820
Comp DS-1-2, Station DS-2	31242-023	Site	Solid	10/25/18	0946	10/25/18	1820

Notes:

^a The Station IDs listed include detailed information written on individual sample buckets.

Table 2. Summary of Sample Compositing Information. 10 day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Composite ID	ESI Code	Components		Final Amount	Composite	
		Station ID	ESI Code		Date	Time
Composite 1 ^a	31243-100	Comp V',W' Station V'	31242-001	~7 gal	10/24/18	1100
		Comp V',W' Station W'	31242-002			
Composite 2	31243-101	Comp R',S' Station R'	31242-003	~28 gal	10/24/18	1545
		Comp R',S' Station S'	31242-004			
Composite 3	31243-102	Comp US-1-2, Station US-1	31242-019	~28 gal	10/25/18	2030
		Comp US-1-2, Station US-2	31242-020			
Composite 4	31243-103	Comp DS-1-2, Station DS-1	31242-012	~28 gal	10/25/18	2000
		Comp DS-1-2, Station DS-2	31242-013			
		Comp DS-1-2, Station DS-2	31242-023			
Composite 5	31243-104	Comp TB-1-2, Station TB-1	31242-010	~28 gal	10/25/18	1110
		Comp TB-1-2, Station TB-2	31242-011			
Composite 6	31243-105	Comp CAD 1-3 Station CAD 1	31242-005	~31 gal	10/24/18	1115
		Comp CAD 1-3 Station CAD 2	31242-006			
		Comp CAD 1-3 Station CAD 3	31242-007			

Note:

^a This sample was not included in the 10 day solid phase evaluation.

Table 3. Summary of Reference Toxicant Data Summary. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Date	Organism Lot	Endpoint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>Americamysis bahia</i>						
11/09/18	03AbARO110818	96Hr LC-50	90.8 ^a	62.2	34.6 - 89.8	NH4Cl (mg/L)
<i>Leptocheirus plumulosus</i>						
11/09/18	19LpARO110818	96Hr LC-50	225.0	183.1 ^b	84.6 - 281.6 ^b	Ammonia (mg/L)

Notes:

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays unless otherwise noted.

^a Normal Acceptance Limits set at ± 2 Std Dev of historic mean; maximum limits are ± 3 Std of historic mean. The ± 3 limit is acceptable, but considered high.

^b Means and acceptable ranges are based on the results of 9 assays.

Table 4. Summary of Laboratory Control Performance. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Endpoint / Measurement	Protocol Criteria	Unit	<i>A. bahia</i>	<i>L. plumulosus</i>
Mean Survival	Laboratory Control $\geq 90\%$	%	98%	98%
		Protocol Met	Yes	Yes
Salinity	Minimum	<i>A. bahia</i> - 28ppt	24.6	17.2
		<i>L. plumulosus</i> - 18ppt	No ^a	No ^a
	Maximum	<i>A. bahia</i> - 32ppt	32.9	23.6
		<i>L. plumulosus</i> - 22ppt	No ^a	No ^a
Temperature	Mean: $20 \pm 1^\circ\text{C}$	Daily / Hourly $^\circ\text{C}$	20.9 / 21.0	20.9 / 21.0
	Minimum: 17°C	Daily / Hourly $^\circ\text{C}$	19.7 / 19.8	20.0 / 19.8
	Maximum: 23°C	Daily / Hourly $^\circ\text{C}$	21.7 / 21.8	21.7 / 21.8
		Protocol Met	Yes / Yes	Yes / Yes
Dissolved Oxygen	≥ 6.0 mg/L (ESI)	Minimum mg/L	6.2	4.9
		Protocol Met	Yes	No ^a
	$\geq 40\%$ Saturation (RIM)	Minimum %	85%	62%
		Protocol Met	Yes	Yes

Notes:

^a Refer to Section 3.3 for a discussion of the deviation.

^b Values meets the criterion when rounded to the whole number precision reflected in the protocol.

Table 5. Summary of Survival Data: *A. bahia*. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Day 10 Proportion Survived Summary

Sample ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	31245-000	5	98%	90%	100%	5%
CLDS Reference Site	31242-008	5	63%	10%	100%	65%
Composite 2	31243-101	5	92%	85%	95%	5%
Composite 3	31243-102	5	91%	85%	100%	7%
Composite 4	31243-103	5	91%	85%	95%	5%
Composite 5	31243-104	5	95%	90%	100%	5%
Composite 6	31243-105	5	96%	90%	100%	6%

Day 10 Survival Statistical Analysis

Sample ID	ESI Code	Mean	Significantly "<" as Compared to: CLDS (31242-008)	Difference in Survival >20% as Compared to: CLDS (31242-008)
CLDS Reference Site	31242-008	63%	-	-
Composite 2	31243-101	92%	No	No ^a -29%
Composite 3	31243-102	91%	No	No ^a -28%
Composite 4	31243-103	91%	No	No ^a -28%
Composite 5	31243-104	95%	No	No ^a -32%
Composite 6	31243-105	96%	No	No ^a -33%

Note:

^a The difference in survival is >20%, however survival is improved in the site composite samples as compared with the CLDS reference sediment.

Table 6. Summary of Survival Data: *L. plumulosus*. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Day 10 Proportion Survived Summary

Sample ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	31244-000	5	98%	95%	100%	3%
CLDS Reference Site	31242-008	5	79%	15%	100%	46%
Composite 2	31243-101	5	94%	90%	100%	6%
Composite 3	31243-102	5	96%	90%	100%	4%
Composite 4	31243-103	5	92%	85%	95%	5%
Composite 5	31243-104	5	99%	95%	100%	2%
Composite 6	31243-105	5	94%	90%	100%	4%

Day 10 Survival Statistical Analysis

Sample ID	ESI Code	Mean	Significantly "<" as Compared to: CLDS (31242-008)	Difference in Survival >20% as Compared to: CLDS (31242-008)
CLDS Reference Site	31242-008	79%	-	-
Composite 2	31243-101	94%	No/No	No -15%
Composite 3	31243-102	96%	No/No	No -17%
Composite 4	31243-103	92%	No/No	No -13%
Composite 5	31243-104	99%	No/No	No ^a -20%
Composite 6	31243-105	94%	No/No	No -15%

Note:

No/No indicates that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

^a The difference in survival is equal to 20% in Composite 5, however survival is improved in all the site composite samples as compared with the CLDS reference sediment.

Table 7. Summary of Overlying Water Quality Data: *A. bahia*. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Sample ID	Day	Temperature (°C)	pH (SU)	Salinity (ppt)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<u>In-Life Assay Data</u>						
Laboratory Control	00	20.3	7.71	28.02	0.15	0.0026
CLDS Reference Site	00	20.0	7.82	28.42	<0.1	<0.0022
Composite 2	00	20.1	7.89	28.39	1.6	0.0413
Composite 3	00	20.0	7.92	28.72	1.8	0.0493
Composite 4	00	20.3	7.91	28.66	2.2	0.0602
Composite 5	00	20.6	7.90	28.57	2.5	0.0684
Composite 6	00	20.7	7.89	28.64	0.61	0.0164
Laboratory Control	03	21.2	7.54	28.88	0.63	0.0080
CLDS Reference Site	03	21.0	7.67	29.19	0.13	0.0022
Composite 2	03	21.1	7.74	29.75	3	0.0590
Composite 3	03	21.1	7.77	29.20	1.6	0.0338
Composite 4	03	21.2	7.79	29.09	1.8	0.0401
Composite 5	03	21.2	7.81	29.45	3.4	0.0790
Composite 6	03	21.3	7.82	30.09	<0.1	<0.0024
Laboratory Control	10	21.2	7.57	24.75	0.56	0.0078
CLDS Reference Site	10	20.9	7.73	25.44	0.15	0.0029
Composite 2	10	21.2	7.90	25.41	0.21	0.0061
Composite 3	10	21.2	7.99	25.31	0.16	0.0057
Composite 4	10	21.2	8.03	25.67	0.31	0.0120
Composite 5	10	21.3	8.12	24.60	0.21	0.0101
Composite 6	10	21.3	7.97	25.87	<0.1	<0.0034

Note: Data in summary obtained from the "A" replicate of each treatment.

Table 8. Summary of Overlying Water Quality Data: *L. plumulosus*. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Sample ID	Day	Temperature (°C)	pH (SU)	Salinity (ppt)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<u>In-Life Assay Data</u>						
Laboratory Control	00	20.2	7.78	18.50	<0.1	<0.0021
CLDS Reference Site	00	20.0	7.78	19.01	<0.1	<0.0021
Composite 2	00	20.3	7.93	18.78	4.3	0.1298
Composite 3	00	20.3	7.89	18.59	2.1	0.0580
Composite 4	00	20.3	7.91	18.62	2.2	0.0636
Composite 5	00	20.3	7.90	19.12	2	0.0564
Composite 6	00	20.4	7.89	19.35	0.68	0.0189
Laboratory Control	03	21.1	6.30	18.63	0.47	0.0004
CLDS Reference Site	03	20.8	6.52	19.67	<0.1	<0.0001
Composite 2	03	21.0	7.26	21.06	5.7	0.0392
Composite 3	03	21.1	7.48	18.94	1.6	0.0185
Composite 4	03	21.1	7.54	18.93	1.7	0.0226
Composite 5	03	21.1	7.59	18.74	2.6	0.0387
Composite 6	03	21.2	7.62	19.89	0.61	0.0097
Laboratory Control	10	20.8	7.00	18.26	0.27	0.0010
CLDS Reference Site	10	20.8	7.17	18.75	<0.1	<0.0006
Composite 2	10	20.8	7.46	20.68	0.18	0.0019
Composite 3	10	21.0	7.59	18.21	<0.1	<0.0015
Composite 4	10	21.0	7.66	18.24	<0.1	<0.0017
Composite 5	10	21.1	7.75	17.36	<0.1	<0.0022
Composite 6	10	21.1	7.72	17.18	<0.1	<0.0020

Note: Data in summary obtained from the “surrogate” replicate of each treatment.

Table 9. Summary of Pore Water Quality Data: *L. plumulosus*. 10 Day Solid Phase Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Sample ID	Day	Temperature (°C)	pH (SU)	Salinity (ppt)	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)
<u>Pre-Assay Data</u>						
Laboratory Control	-02	21.0	4.19	30	1.3	0.0000073
CLDS Reference Site	-02	20.1	7.68	30	2.3	0.0367
Composite 2	-01	21.0	7.60	30	25	0.3551
Composite 3	-01	21.1	7.59	30	32	0.4476
Composite 4	-01	21.1	7.69	30	32	0.5615
Composite 5	-01	21.0	7.56	30	23	0.2983
Composite 6	-01	21.1	7.70	30	11	0.1974
<u>In-Life Assay Data</u>						
Laboratory Control	00	20.9	5.82	20	0.69	0.0002
CLDS Reference Site	00	21.0	7.75	22	<0.5	<0.0104
Composite 2	00	21.0	7.65	24	15	0.2467
Composite 3	00	21.2	7.73	20	6.5	0.1329
Composite 4	00	21.2	7.79	20	6.9	0.1614
Composite 5	00	21.2	7.60	21	16	0.2424
Composite 6	00	21.1	7.84	20	3.8	0.0987
Laboratory Control	03	21.2	6.10	19	1.8	0.0009
CLDS Reference Site	03	21.1	7.63	21	0.28	0.0045
Composite 2	03	21.0	7.57	22	7.2	0.0999
Composite 3	03	20.9	7.44	20	2	0.0207
Composite 4	03	21.0	7.58	20	3.2	0.0459
Composite 5	03	21.1	7.39	20	6.7	0.0628
Composite 6	03	21.1	7.74	21	0.91	0.0188
Laboratory Control	10	21.2	6.60	20	1.2	0.0019
CLDS Reference Site	10	21.0	7.41	21	0.26	0.0025
Composite 2	10	21.2	7.24	21	0.8	0.0053
Composite 3	10	21.3	7.26	21	0.1	0.0007
Composite 4	10	21.1	7.31	21	0.36	0.0028
Composite 5	10	21.1	6.93	20	0.5	0.0016
Composite 6	10	20.9	7.51	20	0.2	0.0024

Note: Data in summary are obtained from the “Surrogate” replicate of each treatment.

**APPENDIX A:
RAW DATA & STATISTICAL SUPPORT**

Contents	Number of Pages
Study Number Record	1
Chain of Custody Records and Sample Receipt Logs	8
Composite Preparation Forms	5
Test Sediment Preparation Notes	0
Pre-Assay Ammonia Mitigation	6
<hr/>	
<i>A. bahia</i> 10 Day Solid Phase Evaluation	
Bench Records (Summary of Test Conditions, Organism History Record, Daily Record, Daily Water Quality Summary, Ammonia Calculations, Day 10 Recovery Bench Sheets)	10
Survival Statistical Analysis Data Package	8
<hr/>	
<i>L. plumulosus</i> 10 Day Solid Phase Evaluation	
Bench Records (Summary of Test Conditions, Organism History Record, Daily Record, Pore Water Quality and pH Records, Daily Water Quality Summary, Ammonia Calculations, Day 10 Recovery Bench Sheets)	11
Survival Statistical Analysis Data Package	15
<hr/>	
Hourly Temperature Profile and Data	8
RIM QC Data Report Tables	2
Assay Review Checklists	1
<hr/>	
Total Appendix Pages	75

STUDY NUMBER RECORD

Issue and complete this form for studies that will require multiple tasks and directly associated support studies. Issue consecutive study numbers at the start of the project to cover all potential elements of the project.

CLIENT: AECOM

CONTACT(S): Kris Van Naerssen

PROJECT: New Haven Harbor 2018

APP. NUMBER:

	Species / Analysis Parameters:	STUDY:
Sample Receipt:		31242
Rinseate Sample Analysis:	Reference Site Analyzed x 3	
Grain Size Analysis:		
Composite Prep/NH3 Mit:		31243
Bulk Sediment Analysis:		
10 Day Assay:	<i>Leptocheirus plumulosus</i>	31244
	<i>Americamysis bahia</i>	31245
Elutriate Preparation:	Type:	31246
Elutriate Analysis:	Pentachlorophenol	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Trace Metals	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PCB Congeners	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Pesticides	<input checked="" type="radio"/> Yes / <input type="radio"/> No
		31247
SPP Assays/NH3 Mit:	<i>Menidia beryllina</i>	
	<i>Americamysis bahia</i>	31248
	<i>Arbacia punctulata</i>	
Bioaccumulation Study:	<i>Macoma nasuta</i>	31249
	<i>Nereis virens</i>	31250
Tissue Analysis:	Trace Metals	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PAH Compounds	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	PCB Congeners	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	Pesticides	<input checked="" type="radio"/> Yes / <input type="radio"/> No

Tissue analyses completed by Alpha Analytical

CHAIN OF CUSTODY RECORD

31242

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	EUTRIATE TESTER	SUSPENDED PHASE TEST	10-DAY WHOLE SED. TEST	28-DAY PROXIMUM			REMARKS
		NEW HAVEN HARBOR											
SAMPLERS: (Signature) RICHARD LOYD <i>Richard B. Loyd</i>													
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION								
10/16/22 10/23/22 10/23/22 1	10/23	11:25	/		COMP U,W'	2	/	/				STATIONS U',W'	
2	10/23	12:15	/		COMP R',S'	8	/	/	/	/		STATIONS R',S'	
3	10/23	15:27	/		COMP CAD 1-3	9	/	/	/	/		STATIONS CAD-1, CAD-2, CAD-3	
Relinquished by: (Signature) <i>Richard B. Loyd</i>			Date/Time 10/23/1800	Received by: (Signature) <i>Chloe My</i>			Relinquished by: (Signature) <i>Chloe My</i>		Date/Time 10/15/18	Date/Time 10/15	Received by: (Signature) <i>Peggy D. Abbe</i>		
Relinquished by: (Signature)			Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Date/Time	Received by: (Signature)		
Relinquished by: (Signature)			Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS					

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Client/Project Name: <i>USACE / AECOM</i>		Project Location: <i>New Haven Harbor / Central CI Disposal Site</i>		Analysis Requested	
Project Number: <i>60588790</i>		Field Logbook No.:			
Sampler (Print Name)/(Affiliation): <i>K. VAN NARSSON / AECOM</i>		Chain of Custody Tape Nos.: <i>N/A</i>			
Signature: <i>[Signature]</i>		Send Results/Report to: <i>K. van Narsson</i>		TAT: <i>A3</i> <i>FOR WORK PLAN</i>	

Container Type	Preservation
P - Plastic	1 - HCl, 4"
A - Amber Glass	2 - H2SO4, 4"
G - Clear Glass	3 - HNO3, 4"
V - VOA Vial	4 - NaOH, 4"
O - Other	5 - NaOH/ZnAc, 4"
E - Encore	6 - Na2S2O3, 4"
	7 - 4"
Matrix Codes:	
DW - Drinking Water	S - Soil
WW - Wastewater	SL - Sludge
GW - Groundwater	SD - Sediment
SW - Surface Water	SO - Solid
ST - Storm Water	A - Air
W - Water	L - Liquid
	P - Product

Field Sample No./Identification	Date	Time	COM P	GRA B	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	ELUTRIANTE PREP	SPP ASSAY	10-DAY TOX	28-DAY TOX/TISSUE	Lab I.D.	Remarks
<i>NHH-CLDS</i>	<i>10/23/18</i>	<i>10:28</i>	<i>X</i>	<i>X</i>	<i>3.5 G (6)</i>	<i>SD</i>	<i>7</i>	<i>NO</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>		<i>FOR WORK PLAN</i>
<i>NHH-CLDS</i>	<i>10/23/18</i>	<i>13:12</i>	<i>X</i>	<i>X</i>	<i>5 G (10)</i>	<i>SW</i>	<i>7</i>	<i>NO</i>	<i>X</i>	<i>X</i>				<i>FOR WORK PLAN / RIM</i>
<i>[Large diagonal line with circled 'V' in the middle]</i>														

Relinquished by: (Print Name)/(Affiliation) <i>K. van Narsson / AECOM</i>	Date: <i>10/23/18</i>	Received by: (Print Name)/(Affiliation) <i>Charles Nixon</i>	Date: <i>10/23</i>	Analytical Laboratory (Destination):
Signature: <i>[Signature]</i>	Time: <i>17:15</i>	Signature: <i>[Signature]</i>	Time: <i>17:15</i>	
Relinquished by: (Print Name)/(Affiliation) <i>Charles Nixon AECOM</i>	Date: <i>10/24</i>	Received by: (Print Name)/(Affiliation)	Date: <i>10/24/18</i>	Sample Shipped Via: Temp blank
Signature: <i>[Signature]</i>	Time: <i>10:15</i>	Signature: <i>[Signature]</i>	Time: <i>10:15</i>	
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:	UPS FedEx Courier Other
Signature:	Time:	Signature:	Time:	Yes No

Q:\GRAPHICS\FORMS\Chain of Custody (COC)\Chain-of-Custody_AECOM_06_3NCR.doc

White: Original (to Lab) Yellow: Lab Pink: Sampler

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/24/18 1015 Date and Time Logged into Lab: 10/31/18 1630
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 5 Custody Seals intact? NA
 Number of COC Pages: 2
 COC Serial Number(s): 02668
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp V',W' Station V'	31242-001	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp V',W' Station W'	31242-002	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp R',S' Station R'	31242-003	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp R',S' Station S'	31242-004	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 1	31242-005	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 2	31242-006	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 3	31242-007	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
NHH-CLDS	31242-008	S	10-Day Solid Phase, 28-Day Bioaccumulation	6x3.5gal	4 C	Yes
NHH-CLDS	31242-009	W	SPP Assay, 10-Day Solid Phase, 28-Day Bioaccumulation	10x3.5gal	4 C	Yes

Notes and qualifications:

See COC

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	ELUTRIATE PREP	SUSPENDED PHASE TEST	10 DAY WHOLE SEPTOX	28-DAY BIOACCUM	REMARKS
NEW HAVEN HARBOR		SAMPLERS: (Signature) RICHARD LOYD <i>[Signature]</i>									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/24		/		COMP TB 1-2	8	/	/	/	SED FROM STATIONS TB-1 & TB-2	
2	10/24		/		COMP DS 1-2	5	/	/	/	SED FROM STATIONS DS-1 & DS-2	
3					COMP US 1-2	8	/	/		WATER FROM NEW HAVEN HBR	
4					COMP DS 1-2	8	/	/			
5					COMP TB 1-2	6	/	/			
6					COMP CAD 1,2,3	6	/	/			
7					COMP U'W'	6	/	/			
8					COMP R'S'	8	/	/			
Relinquished by: (Signature) <i>[Signature]</i>			Date/Time 10/24/15 4:45	Received by: (Signature) Charles Nixon 10/24/15 2:25			Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 10/25/15 8:35	Received by: (Signature) <i>[Signature]</i>		
Relinquished by: (Signature)			Date/Time	Received by: (Signature)			Relinquished by: (Signature)	Date/Time	Received by: (Signature)		
Relinquished by: (Signature)			Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS CAD 1,2,3 7 cubitainers received DS 1-2 6 cubitainers received			

Distribution: Original Accompanies Shipment Copy to 1 to Sample Custodian Copy 2 to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME					NO. OF CONTAINERS	GLUCONATE PREP	SUSPENDED PHASE	10-DAY LIQUID TEST	28-DAY BROUCCON	REMARKS
		NEW HAVEN HARBOR										
SAMPLERS: (Signature)												
RICHARD LOYD <i>Richard B. Loyd</i>												
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION							
9/11	10/24	11:46	/		COMP TB-2	8	/	/	/	/	SED FROM STATIONS TB-1 & TB-2	
11/12	10/24	10:06	/		COMP DS-2	5	/	/	/	/	SED FROM STATIONS DS-1 & DS-2	
11/4	10/24	11:30			COMP US-2	8	/	/			WATER FROM NEW HAVEN HBR	
11/5	10/24	11:45			COMP DS-2	8	/	/				
11/6	10/24	12:00			COMP TB-2	6	/	/				
11/7	10/24	12:15			COMP CAD 1,2,3	6	/	/				
11/7	10/24	12:30			COMP U'W	6	/	/				
11/8	10/24	12:45			COMP R'S	8	/	/				
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Relinquished by: (Signature)		Date/Time	Received by: (Signature)				
<i>Richard B. Loyd</i>		10/24/15 45	<i>Charles N. von</i> 10/24/15 25		<i>Chad King</i>		10/24/15	<i>Byr D. White</i>				
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Relinquished by: (Signature)		Date/Time	Received by: (Signature)				
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)		Date/Time	REMARKS						
						CAD 1,2,3 7 containers received DS-2 6 containers received						

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Richard B. Loyd
 Digitally signed by
 LOYD, RICHARD B. 312443140
 DN: c=US, ou=U.S. Government,
 mail=rlloyd@usace.army.mil, cn=Richard B. Loyd
 Date: 2018.11.01 11:53:23 -0400

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 0835 Date and Time Logged into Lab: 11/27/18 1240
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp TB-1-2, Station TB-1	31242-010	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp TB-1-2, Station TB-2	31242-011	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-1	31242-012	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-013	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	1x3.5gal	4 C	Yes
Comp US 1-2	31242-014	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp DS 1-2	31242-015	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp TB 1-2	31242-016	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp CAD 1,2,3	31242-017	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp V',W'	31242-018	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp R',S'	31242-022	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes

Notes and qualifications:

See COC



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab:

ALPHA Job #:

Project Information

Project Name: NEW HAVEN HARBOR

Project Location: NEW HAVEN, CT

Project #:

Project Manager: RICHARD LOYD

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

ADEX EMAIL

Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program Criteria

Client Information

Client: US ARMY CORPS OF ENG.

Address: 696 VIRGINIA RD
CONCORD, MA 01742

Phone: 978-318-8048

Email: RICHARD.B.LOYD@USACE.ARMY.MIL

Additional Project Information:

ANALYSIS

~~VOC: E 0280 BZ4 S243~~
~~SVOC: BEN PAR~~
~~METALS: CMPT3 MCP14 ERCP15~~
~~METALS: E-RCHAS RCR238 PPP13~~
~~EPH: E-Ranges & Targets Ranges Only~~
~~MPH: E-Ranges & Targets Ranges Only~~
~~E-PCB PEST~~
~~FPH: E-Quant Only E-Fingerprint~~

ELUTRATE PREP
SPP TOX.
10-DAY WHOLE SED TOX
28-DAY BIOACCOM

SAMPLE INFO

Filtration
 Field
 Lab to do

Preservation
 Lab to do

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
	COMP DS 1-2	10/25	9:46	SE	RBL
	COMP US 1-2	10/25	10:23	SE	RBL

STATION DS-23
 STATION US1928

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - E= Encore
 - D= BOD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO₃
 - D= H₂SO₄
 - E= NaOH
 - F= MeOH
 - G= NaHSO₄
 - H= Na₂S₂O₅
 - I= Ascorbic Acid
 - J= NH₄Cl
 - K= Zn Acetate
 - O= Other

Container Type	P P P P
Preservative	A A A A

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Richard B. Loyd</u>	10/25 13:30	<u>[Signature]</u>	10/25 1350
<u>[Signature]</u>	10/25 1820	<u>[Signature]</u>	10/25/18 1820

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
 FORM NO: 01-01 (rev. 12-Mar-2012)

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 1820 Date and Time Logged into Lab: 11/27/18 1245
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp US-1-2, Station US-1	31242-019	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp US-1-2, Station US-2	31242-020	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-023	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes

Notes and qualifications:

See COC

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 2
 Composite Lab ID.: 31243-101 Composite Final Volume: ~ 23g
 Composite Matrix: Solid Composite Container(s): 8x 3.5gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1545
 Initials: MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
R	31242-003	Solid	None	50mL	~ 14g	most dark gray mud, some shells excluded
S	31242-004	Solid	None	50mL	~ 14g	most dark gray mud, some shells exclude

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 3
 Composite Lab ID.: 31243-102 Composite Final Volume: = 28 gal
 Composite Matrix: Solid Composite Container(s): 8x 3.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 2030
 Initials: GRS/MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
US-1	31242-011	S	-	± 10ml	± 1/4 gal	Leaves, sticks
US-2	31242-020	S	-	± 10ml	± 1/4 gal	Leaves, sticks

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 4
 Composite Lab ID.: 31243-103 Composite Final Volume: 228g
 Composite Matrix: Solid Composite Container(s): 8x3.5gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1000
 Initials: BG/LAG
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
DS-1	31242-012	S	—	~ 100g	~ 14g	
DS-2	31242-001-029	S	—	~ 100g rinds	~ 14g	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 5
 Composite Lab ID.: 31243-104 Composite Final Volume: ≈ 28 gal
 Composite Matrix: Solid Composite Container(s): 8 x 2.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1110
 Initials: CFS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
TB-1	31243-104 ³¹²⁴³⁻¹⁰⁴	S	Na	2 Shells	≈ 14gal	
TB-2	31243-104 ³¹²⁴³⁻¹⁰⁴	S	Na	Leaves	≈ 14gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 6
 Composite Lab ID.: 31243-105 Composite Final Volume: ≈ 31 gal
 Composite Matrix: Solid Composite Container(s): 9 x 8.5 gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1115
 Initials: Bb/
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
CAD-1	31242-005	S	—	≈ 1 L	≈ 10 gal	shells and rocks included
CAD-2	31242-006	S	—	≈ 500 mL	≈ 7 gal	
CAD-3	31242-007	S	—	≈ 1 L	≈ 14 gal	
						All to back sediments with a portion small

Subsamples Removed:

Lab Number	Sample Use
31246	Elutriate Preparation

2
 Study: 31243² ENR 11/03
 Client: AECOM
 Project: New Haven

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature °C	Salinity	pH value
Comp R,S	31243-101	605	19.7	28	7.56
Comp U,S	31243-102	606	19.4	30	7.47
Comp D,S	31243-103	607	19.8	32	7.61
Comp T,B	31243-104	608	19.9	30	7.59
Comp CAD	31243-105	609	20.0	32	7.75

Date: 11/03/18 pH Meter ID: ML02 Salinity Meter ID: ESI #1
 Initial: BG

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature °C	Salinity	pH value
Comp R,S	31243-101	610	20.2	30	7.62
Comp U,S	31243-102	611	20.2	30	7.57
Comp D,S	31243-103	612	20.2	30	7.64
Comp T,B	31243-104	613	20.4	30	7.60
Comp CAD	31243-105	614	20.2	30	7.75

Date: 11/03/18 pH Meter ID: ML02 Salinity Meter ID: ESI #1
 Initial: BG

Study: 31242
Client: AECOM
Project: New Haven

Day 01 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Lab Control	31243-000	700	19.3	31	4.37
CLDS Ref	31242-009	701	18.4 ^{20.1}	31 ³⁰	4.61 ^{7.68}
Lab Control	31243-000	702 708	18.4	31	4.61
CLDS Ref	31242-009	703 709	21.0	30 ³⁰	4.19
Comp V, W	31243-001	704 702	20.1	30	7.64
Comp R, S	31243-002	705 703	19.7	30	7.55
Comp U, S	31243-003	706 704	19.8	30	7.61
Comp D, S	31243-004	707 705	20.3	30	7.68
Comp T, B	31243-005	708 706	20.6	30	7.76
Comp CAD	31243-006	709 707	20.2	30	7.70

Date: 11/07/18 pH Meter ID: MLOZ Salinity Meter ID: ESI #1
Initial: MS

Day 02 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	710	21.1	30	7.58
Comp R, S	31243-002	711	21.0	30	7.60
Comp U, S	31243-003	712	21.1	30	7.59
Comp D, S	31243-004	713	21.1	30	7.69
Comp T, B	31243-005	714	21.0	30	7.56
Comp CAD	31243-006	715	21.1	30	7.70

Date: 11/08/18 pH Meter ID: MLOZ Salinity Meter ID: ESI #1
Initial: BK

Day 03 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	716	17.6	28	7.38
Comp R, S	31243-002	717	18.0	28	7.53
Comp U, S	31243-003	718	18.4	28	7.51
Comp D, S	31243-004	719	18.5	30	7.57
Comp T, B	31243-005	720	18.7	30	7.37
Comp CAD	31243-006	721	18.3	28	7.68

Date: 11/09/18 pH Meter ID: MLOZ Salinity Meter ID: ESI #1
Initial: BK

Study: 31242
 Client: AECOM
 Project: New Haven

Day 04 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	722	20.7	30	7.40
Comp R, S	31243-002	723	20.1	32	7.48
Comp U, S	31243-003	724	20.1	30	7.42
Comp D, S	31243-004	725	20.1	30	7.48
Comp T, B	31243-005	726	20.2	32	7.38
Comp CAD	31243-006	727	20.4	30	7.58

Date: 11/10/18
 Initial: BL

pH Meter ID: ML02 Salinity Meter ID: ESI #1

Day 05 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp V, W	31243-001	728	20.5	30	7.33
Comp R, S	31243-002	729	19.5	30	7.38
Comp U, S	31243-003	730	19.5	30	7.43
Comp D, S	31243-004	731	19.5	30	7.43
Comp T, B	31243-005	732	19.5	30	7.38
Comp CAD	31243-006	733	19.0	31	7.57

Date: 11/11/18
 Initial: MS

pH Meter ID: ML02 Salinity Meter ID: ESI #1

Study: 31242

Client: AECOM

Project: New Haven

Day 06 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp U,S	31243-102	734	18.4	30	7.36
Comp T, B	31243-104	735	18.4	30	7.35

Date: 11/12/18 pH Meter ID: MLOZ Salinity Meter ID: ESI#1
Initial: BG

Day 07 Pore Water Quality

Field ID	ESI Code	Sample Number	Temperature	Salinity	pH value
Comp U, S	31243-102	736	17.8	28	7.29

Date: 11/13/18 pH Meter ID: MLVL Salinity Meter ID: ESI#1
Initial: BG

STUDY: 31243
 CLIENT: AECOM
 PROJECT: New Haven Harbor Supplemental 2018
 ASSAY: Suspended Particulate Phase
 TASK: Pore Water Ammonia Summary
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fracti
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (;
 Where: I = Ionic Strength (19.9273*N11)/(1000-1.005109*N11)
 pKa = ionization constant of ammonium ion in aqueous saline solution
 FNH3 = fraction of UIA (+1/(1+10^(R11+0.0324*(298-P11)))+(0.0415
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in FNH3 assumed to be 1 atm

Sample ID	Hour	ESI Code	Ammonia				Sampled	Analyzed	L temp (EC)	M pH (SU)	N salinity (ppt)	O Tot NH3	P Temp (EK) I	Q pKa	R FNH3	S FNH3
			Total	Qual	Unionized	QLimit										
Comp 004 (DS-1, DS-2)	24	31243-602	36	#VALUE!	0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data				36	#VALUE!	0	9.245	#VALUE!
Comp 004 (DS-1, DS-2)	48	31243-607	40	0.5262	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.8	7.61	32	40	292.95	0.66	9.321	0.01315	
Comp 004 (DS-1, DS-2)	48	31243-612	31	0.4546	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.64	30	31	293.35	0.62	9.317	0.01466	
Comp 004 (DS-1, DS-2)	24	31243-705	48	0.7764	0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.3	7.68	30	48	293.45	0.62	9.317	0.01618	
Comp 004 (DS-1, DS-2)	48	31243-713	32	0.5615	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.69	30	32	294.25	0.62	9.317	0.01755	
Comp 004 (DS-1, DS-2)	72	31243-719	16	0.1766	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.5	7.57	30	16	291.65	0.62	9.317	0.01104	
Comp 004 (DS-1, DS-2)	96	31243-725	8.4	0.0850	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.1	7.48	30	8.4	293.25	0.62	9.317	0.01012	
Comp 004 (DS-1, DS-2)	120	31243-731	10	0.0863	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.43	30	10	292.65	0.62	9.317	0.00863	
Comp 005 (TB-1, TB-2)	24	31243-205	31	0.5132	0.5 mg/L as N	10/25/18 1000	10/25/18 1130	20	7.70	30	31	293.15	0.62	9.317	0.01656	
Comp 005 (TB-1, TB-2)	48	31243-213	18	0.1439	0.1 mg/L as N	10/27/18 1350	10/28/18	20	7.38	30	18	293.15	0.62	9.317	0.00799	
Comp 005 (TB-1, TB-2)	72	31243-219	13	0.0917	0.1 mg/L as N	10/28/18 1145	10/28/18	18	7.39	30	13	291.15	0.62	9.317	0.00705	
Comp 005 (TB-1, TB-2)	96	31243-225	13	0.0959	0.2 mg/L as N	10/29/18 1130	10/29/18 1130	20	7.35	32	13	293.15	0.66	9.321	0.00738	
Comp 005 (TB-1, TB-2)	24	31243-603	45	#VALUE!	0.2 mg/L as N	11/02/18 1250	11/05/18 1030	No data			45	#VALUE!	0	9.245	#VALUE!	
Comp 005 (TB-1, TB-2)	48	31243-608	38	0.4866	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	19.9	7.59	30	38	293.05	0.62	9.317	0.0128	
Comp 005 (TB-1, TB-2)	48	31243-613	40	0.5436	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.4	7.60	30	40	293.55	0.62	9.317	0.01359	
Comp 005 (TB-1, TB-2)	24	31243-706	50	0.9907	1 mg/L as N	11/07/18 1100	11/08/18 1030	20.6	7.76	30	50	293.75	0.62	9.317	0.01981	
Comp 005 (TB-1, TB-2)	48	31243-714	23	0.2983	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.0	7.56	30	23	294.15	0.62	9.317	0.01297	
Comp 005 (TB-1, TB-2)	72	31243-720	9.5	0.0674	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.7	7.37	30	9.5	291.85	0.62	9.317	0.0071	
Comp 005 (TB-1, TB-2)	96	31243-726	9.5	0.0762	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.2	7.38	32	9.5	293.35	0.66	9.321	0.00802	
Comp 005 (TB-1, TB-2)	120	31243-732	12	0.0924	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.5	7.38	30	12	292.65	0.62	9.317	0.0077	
Comp 005 (TB-1, TB-2)	144	31243-735	6.1	0.0404	0.2 mg/L as N	11/12/18 1500	11/13/18 1100	18.4	7.35	30	6.1	291.55	0.62	9.317	0.00663	
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-102	12	0.3011	0.5 mg/L as N	10/26/18 1000	10/26/18 1145	18.9	7.92	30	12	292.05	0.62	9.317	0.02509	
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-206	5.5	0.0760	0.5 mg/L as N	10/26/18 1000	10/26/18 1145	20	7.62	30	5.5	293.15	0.62	9.317	0.01381	
Comp 006 (CAD-1, CAD-2, CAD-3)	72	31243-214	4.2	0.0590	0.1 mg/L as N	10/27/18 1350	10/28/18	20	7.63	31	4.2	293.15	0.64	9.319	0.01405	
Comp 006 (CAD-1, CAD-2, CAD-3)	96	31243-220	3	0.0325	0.1 mg/L as N	10/28/18 1145	10/28/18	19	7.55	32	3	292.15	0.66	9.321	0.01082	
Comp 006 (CAD-1, CAD-2, CAD-3)	120	31243-226	3	0.0374	0.2 mg/L as N	10/29/18 1130	10/29/18 1130	20	7.58	32	3	293.15	0.66	9.321	0.01247	
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-604	13	#VALUE!	0.1 mg/L as N	11/02/18 1250	11/02/18 1000	No data			13	#VALUE!	0	9.245	#VALUE!	
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-609	14	0.2567	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20	7.75	32	14	293.15	0.66	9.321	0.01833	
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-614	18	0.3386	0.2 mg/L as N	11/03/18 1300	11/05/18 1030	20.2	7.75	30	18	293.35	0.62	9.317	0.01881	
Comp 006 (CAD-1, CAD-2, CAD-3)	24	31243-707	16	0.2688	0.5 mg/L as N	11/07/18 1100	11/08/18 1030	20.2	7.70	30	16	293.35	0.62	9.317	0.0168	
Comp 006 (CAD-1, CAD-2, CAD-3)	48	31243-715	11	0.1974	0.5 mg/L as N	11/08/18 1000	11/09/18 1300	21.1	7.70	30	11	294.25	0.62	9.317	0.01795	
Comp 006 (CAD-1, CAD-2, CAD-3)	72	31243-721	6	0.0847	0.5 mg/L as N	11/09/18 1130	11/09/18 1300	18.3	7.68	28	6	291.45	0.57	9.312	0.01412	
Comp 006 (CAD-1, CAD-2, CAD-3)	96	31243-727	4.2	0.0545	0.5 mg/L as N	11/10/18 1330	11/12/18 1100	20.4	7.58	30	4.2	293.55	0.62	9.317	0.01299	
Comp 006 (CAD-1, CAD-2, CAD-3)	120	31243-733	3.5	0.0399	0.5 mg/L as N	11/11/18 1300	11/12/18 1100	19.0	7.57	31	3.5	292.15	0.64	9.319	0.01139	

Highlighted data are pre-assay results (Day -01 and -02) presented in Table 9

10 DAY SEDIMENT ASSAY

Study #:	31245	Water Bath ID	6
Project:	New Haven Harbor	Client:	AECOM

Summary of Test Conditions

Exposure	Species Used
<p>Test Mode: In-Life: Static renewal 1 volume replacement daily</p> <p>Length of Assay: 10 days</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>)</p> <p><input type="checkbox"/> Marine Amphipod (<i>Leptocheirus plumulosus</i>)</p>

Water Quality Parameters

<p>Salinity: <i>A. bahia</i>: 30 ± 2 ppt <i>L. plumulosus</i>: 20 ± 2 ppt</p> <p>pH: 7.8 ± 0.5</p>	<p>Photoperiod: 16 hour light, 8 hour dark</p> <p>Temperature: 20 ± 1 °C</p>
--	--

Test Chamber	Solution & Sediment Volume
<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 1000 mL beaker</p> <p><input type="checkbox"/> other _____</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 2 cm (~175mL) homogenized sediment</p> <p><input type="checkbox"/> ~800 mL overlying water</p> <p><input checked="" type="checkbox"/> other <u>725mL OW</u></p>

Replicate Information

- A. bahia* and *L. plumulosus*:
- 5 Reps per treatment for survival endpoint
 - 20 organisms per chamber
 - 1 surrogate replicate for water quality (*Lp* only)
 - Continuous aeration from start

Cleaning	Treatments
<p>Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed then rinsed with deionized water (EPA 2002).</p>	<p>Laboratory Control, Reference Site, and Site Sediments</p>

Feeding

<p style="text-align: center;"><i>A. bahia</i>:</p> <p>Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i></p>	<p style="text-align: center;"><i>L. plumulosus</i>:</p> <p style="text-align: center;">NONE</p>
---	--

Date: 11/09/18

Initial JTP



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species AMERICAMYSIS bahia

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 11-5-18 Receipt date _____

Lot number 110518MS Strain _____

Brood origination FLORIDA

II. Water Quality

Temperature 25 °C Salinity 28 ppt D.O. _____ ppm

pH 7.8 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating Flow through _____ Static renewal _____

DIET: Flake food Phytoplankton _____ Trout chow _____

Artemia Rotifers _____ YCT _____ Other ENCAP. SHRIMP DIET

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: ESI # of Organisms 1000+

Carrier: _____ Date shipped 11-8-18

Biologist: [Signature]

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

DAY10 Sediment Assay Data Summary

STUDY #: 31245 WATER BATH ID: 6
 CLIENT: AECOM PROJECT: New Haven Harbor

INITIATION RECORD			
Species:	Americamysis bahia	Counted by:	BG
Organism Lot ID:	03ABAR0110818	Added by:	BG
Number of Organisms added to each vessel:	20	Temp Data Logger No:	010015860

DAILY LOG				
Day	Daily Water Quality Performed Date / Initials	Renew Daily (One Exchange)	Feeding ¹ (A - 5:19)	Biological Observations ² (N= Normal)
0*	11/09/18 BG	✓	✓	N
1	11/10/18 BG	✓	✓	N
2	11/11/18 MS	✓	✓	N
3	11/12/18 MS	✓	✓	N
4	11/13/18 MS	✓	✓	N
5	11/14/18 MS	✓	✓	N
6	11/15/18 MS	✓	✓	N
7	11/16/18 BG	✓	✓	N
8	11/17/18 BG	✓	✓	N
9	11/18/18 MS	✓	✓	N
10*	11/19/18 MS	✓	✓	N

* On Day 0 and Day 10 water quality parameters were performed on all beakers.

¹ Mysid were fed < 24 hour old brine shrimp twice daily.

² Organisms were monitored daily. Due to the study design and the nature of each sample matrix it maybe difficult to achieve accurate counts until termination. If organisms appear to be active in the water column they are likely in good health (N=normal) unless otherwise noted.

Overlying water collected for NH ₃	Day 0	Initial: BG
	Day 3	Initial: MS
	Day 10	Initial: MS

Comments

STUDY: 31245
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Americamysis bahia* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.18	94.2		43815	28.31
Minimum:	19.7	6.19	85.2	6.69	38619	24.60
Maximum:	21.7	7.68	99.0	8.17	50129	32.89

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	00	11/9/2018 17:39:04	20.3	7.34	94.9	7.71	43410	28.02
Laboratory Control	B	00	11/9/2018 17:39:35	20.1	7.63	98.5	7.75	43932	28.39
Laboratory Control	C	00	11/9/2018 17:40:01	20.2	7.65	98.9	7.75	43878	28.35
Laboratory Control	D	00	11/9/2018 17:40:21	20.2	7.65	98.9	7.76	43855	28.34
Laboratory Control	E	00	11/9/2018 17:40:43	20.2	7.66	99.0	7.76	43806	28.30
CLDS Reference	A	00	11/9/2018 17:41:12	20.0	7.48	96.4	7.82	43972	28.42
CLDS Reference	B	00	11/9/2018 17:41:33	19.8	7.50	96.7	7.85	44642	28.91
CLDS Reference	C	00	11/9/2018 17:41:59	20.0	7.56	97.4	7.85	43892	28.37
CLDS Reference	D	00	11/9/2018 17:42:24	20.1	7.65	98.7	7.86	43920	28.39
CLDS Reference	E	00	11/9/2018 17:43:06	20.4	7.58	98.4	7.86	43888	28.36
Composite 2	A	00	11/9/2018 17:43:35	20.1	7.59	98.1	7.89	43926	28.39
Composite 2	B	00	11/9/2018 17:43:59	19.9	7.68	98.8	7.89	44011	28.45
Composite 2	C	00	11/9/2018 17:44:23	20.0	7.53	97.0	7.90	43851	28.34
Composite 2	D	00	11/9/2018 17:44:50	20.2	7.53	97.3	7.91	43833	28.32
Composite 2	E	00	11/9/2018 17:45:10	20.5	7.49	97.3	7.93	43910	28.37
Composite 3	A	00	11/9/2018 17:45:40	20.0	7.32	94.5	7.92	44387	28.72
Composite 3	B	00	11/9/2018 17:46:08	19.7	7.37	94.9	7.92	45116	29.25
Composite 3	C	00	11/9/2018 17:46:33	20.0	7.49	96.5	7.92	44135	28.54
Composite 3	D	00	11/9/2018 17:46:57	20.1	7.61	98.3	7.92	44166	28.56
Composite 3	E	00	11/9/2018 17:47:21	20.3	7.50	97.3	7.92	44168	28.56
Composite 4	A	00	11/9/2018 17:47:53	20.3	7.44	96.6	7.91	44300	28.66
Composite 4	B	00	11/9/2018 17:48:45	20.2	7.33	95.1	7.90	44301	28.66
Composite 4	C	00	11/9/2018 17:49:16	20.3	7.42	96.2	7.96	44143	28.54
Composite 4	D	00	11/9/2018 17:49:40	20.3	7.52	97.5	7.92	44147	28.55
Composite 4	E	00	11/9/2018 17:50:10	20.3	7.42	96.4	7.91	44228	28.61
Composite 5	A	00	11/9/2018 17:50:35	20.6	7.22	94.1	7.90	44177	28.57
Composite 5	B	00	11/9/2018 17:50:57	20.6	7.48	97.7	7.90	44276	28.64
Composite 5	C	00	11/9/2018 17:51:13	20.6	7.44	97.1	7.90	44391	28.72
Composite 5	D	00	11/9/2018 17:51:47	20.5	7.38	96.3	7.91	44309	28.66
Composite 5	E	00	11/9/2018 17:52:11	20.4	7.53	97.9	7.90	44218	28.60
Composite 6	A	00	11/9/2018 17:52:49	20.7	7.37	96.3	7.89	44288	28.64
Composite 6	B	00	11/9/2018 17:53:13	20.8	7.45	97.7	7.89	44569	28.85
Composite 6	C	00	11/9/2018 17:53:37	20.8	7.40	97.0	7.92	44188	28.57
Composite 6	D	00	11/9/2018 17:53:56	20.6	7.48	97.6	7.90	44290	28.65
Composite 6	E	00	11/9/2018 17:54:20	20.8	7.47	97.7	7.90	44256	28.62
Laboratory Control	A	01	11/10/2018 16:11:00	21.6	7.06	95.7	7.66	45826	29.75
CLDS Reference	A	01	11/10/2018 16:11:33	21.4	7.01	95.1	7.82	46563	30.28
Composite 2	A	01	11/10/2018 16:11:58	21.4	6.92	93.9	7.90	46580	30.30
Composite 3	A	01	11/10/2018 16:12:22	21.5	7.05	95.9	7.92	46880	30.51
Composite 4	A	01	11/10/2018 16:12:41	21.6	6.90	94.0	7.92	46666	30.36
Composite 5	A	01	11/10/2018 16:13:04	21.7	6.68	91.1	7.91	46633	30.33
Composite 6	A	01	11/10/2018 16:13:27	21.7	6.95	94.8	7.92	46794	30.45
Laboratory Control	A	02	11/11/2018 10:56:41	21.1	7.13	94.1	6.69	45092	29.22
CLDS Reference	A	02	11/11/2018 10:57:03	20.9	7.30	96.2	7.31	45469	29.50
Composite 2	A	02	11/11/2018 10:57:26	20.9	7.18	94.7	7.58	45377	29.43
Composite 3	A	02	11/11/2018 10:57:42	21.0	7.12	94.0	7.66	45807	29.74

STUDY: 31245
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Americamysis bahia* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.18	94.2		43815	28.31
Minimum:	19.7	6.19	85.2	6.69	38619	24.60
Maximum:	21.7	7.68	99.0	8.17	50129	32.89

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	02	11/11/2018 10:57:59	21.1	7.09	93.9	7.72	45755	29.70
Composite 5	A	02	11/11/2018 10:58:15	21.2	7.03	93.4	7.75	46008	29.88
Composite 6	A	02	11/11/2018 10:58:26	21.2	7.08	94.0	7.76	45757	29.70
Laboratory Control	A	03	11/12/2018 10:33:46	21.2	7.15	93.8	7.54	44620	28.88
CLDS Reference	A	03	11/12/2018 10:34:07	21.0	7.16	93.8	7.67	45054	29.19
Composite 2	A	03	11/12/2018 10:34:25	21.1	7.17	94.3	7.74	45824	29.75
Composite 3	A	03	11/12/2018 10:34:44	21.1	7.04	92.3	7.77	45066	29.20
Composite 4	A	03	11/12/2018 10:35:08	21.2	7.20	94.6	7.79	44908	29.09
Composite 5	A	03	11/12/2018 10:35:36	21.2	7.16	94.3	7.81	45405	29.45
Composite 6	A	03	11/12/2018 10:36:01	21.3	7.08	93.7	7.82	46290	30.09
Laboratory Control	A	04	11/13/2018 09:00:12	21.4	7.04	93.5	7.65	43626	28.16
CLDS Reference	A	04	11/13/2018 09:00:40	21.3	7.19	95.3	7.79	43931	28.38
Composite 2	A	04	11/13/2018 09:01:03	21.3	7.04	93.6	7.85	44354	28.69
Composite 3	A	04	11/13/2018 09:01:21	21.3	7.09	94.1	7.88	44090	28.50
Composite 4	A	04	11/13/2018 09:01:34	21.4	7.01	93.3	7.87	44252	28.61
Composite 5	A	04	11/13/2018 09:01:52	21.4	7.06	94.0	7.87	44041	28.46
Composite 6	A	04	11/13/2018 09:02:19	21.5	6.95	92.7	7.87	44429	28.74
Laboratory Control	A	05	11/14/2018 10:56:50	21.0	6.86	90.6	7.69	45577	29.57
CLDS Reference	A	05	11/14/2018 10:57:08	20.9	6.89	90.8	7.75	45733	29.69
Composite 2	A	05	11/14/2018 10:57:25	20.9	6.80	90.1	7.77	46423	30.19
Composite 3	A	05	11/14/2018 10:57:53	20.9	6.67	88.2	7.81	46251	30.06
Composite 4	A	05	11/14/2018 10:58:16	21.0	6.47	85.8	7.79	46615	30.33
Composite 5	A	05	11/14/2018 10:58:38	21.1	6.61	87.7	7.83	46140	29.98
Composite 6	A	05	11/14/2018 10:58:56	21.1	6.73	89.5	7.81	46436	30.19
Laboratory Control	A	06	11/15/2018 10:02:46	20.8	7.12	92.2	7.68	44577	28.85
CLDS Reference	A	06	11/15/2018 10:03:05	20.7	7.22	93.5	7.74	44997	29.16
Composite 2	A	06	11/15/2018 10:03:32	20.8	7.12	92.5	7.82	45804	29.74
Composite 3	A	06	11/15/2018 10:03:47	20.8	7.15	92.9	7.88	45698	29.66
Composite 4	A	06	11/15/2018 10:04:03	20.9	7.10	93.0	7.86	47043	30.64
Composite 5	A	06	11/15/2018 10:04:24	21.0	6.94	90.5	7.94	45525	29.54
Composite 6	A	06	11/15/2018 10:04:41	21.0	7.12	93.0	7.89	45762	29.71
Laboratory Control	A	07	11/16/2018 11:36:19	21.2	6.63	90.7	7.79	47148	30.71
CLDS Reference	A	07	11/16/2018 11:36:42	21.1	6.36	86.9	7.88	47499	30.97
Composite 2	A	07	11/16/2018 11:36:59	21.1	6.48	89.2	7.94	49062	32.11
Composite 3	A	07	11/16/2018 11:37:22	21.1	6.48	88.9	8.05	48249	31.51
Composite 4	A	07	11/16/2018 11:37:55	21.2	6.22	86.1	8.02	50129	32.89
Composite 5	A	07	11/16/2018 11:38:13	21.2	6.19	85.2	8.12	48270	31.53
Composite 6	A	07	11/16/2018 11:38:39	21.3	6.30	86.8	8.01	48479	31.68
Laboratory Control	A	08	11/17/2018 10:28:24	21.2	6.74	90.6	7.77	47046	30.64
CLDS Reference	A	08	11/17/2018 10:29:05	21.0	7.02	93.7	7.87	46048	29.91
Composite 2	A	08	11/17/2018 10:29:24	21.0	7.12	95.3	7.93	46680	30.37
Composite 3	A	08	11/17/2018 10:29:49	21.1	6.57	88.0	8.01	46543	30.27

STUDY: 31245
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Americamysis bahia* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.18	94.2		43815	28.31
Minimum:	19.7	6.19	85.2	6.69	38619	24.60
Maximum:	21.7	7.68	99.0	8.17	50129	32.89

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	08	11/17/2018 10:30:11	21.2	6.63	89.2	7.99	47158	30.72
Composite 5	A	08	11/17/2018 10:30:46	21.3	6.37	86.2	8.17	48060	31.37
Composite 6	A	08	11/17/2018 10:31:04	21.3	6.76	91.0	8.05	46915	30.54
Laboratory Control	A	09	11/18/2018 10:48:08	20.9	7.33	94.9	7.43	42271	27.20
CLDS Reference	A	09	11/18/2018 10:48:40	20.7	7.35	95.1	7.68	42897	27.65
Composite 2	A	09	11/18/2018 10:49:01	20.9	7.35	95.9	7.80	44169	28.56
Composite 3	A	09	11/18/2018 10:49:23	20.9	7.28	94.3	7.91	42600	27.43
Composite 4	A	09	11/18/2018 10:49:49	20.9	7.28	94.0	7.92	41616	26.73
Composite 5	A	09	11/18/2018 10:50:06	21.0	7.11	92.6	8.07	43437	28.03
Composite 6	A	09	11/18/2018 10:50:17	21.0	7.18	94.1	7.97	44484	28.78
Laboratory Control	A	10	11/19/2018 14:43:27	21.2	7.49	97.1	7.57	38828	24.75
Laboratory Control	B	10	11/19/2018 14:43:43	21.2	7.46	97.0	7.63	39615	25.30
Laboratory Control	C	10	11/19/2018 14:43:55	21.2	7.46	96.9	7.65	39351	25.12
Laboratory Control	D	10	11/19/2018 14:44:09	21.2	7.49	97.1	7.67	38825	24.75
Laboratory Control	E	10	11/19/2018 14:44:22	21.2	7.43	96.5	7.69	39156	24.98
CLDS Reference	A	10	11/19/2018 14:44:36	20.9	7.43	96.1	7.73	39797	25.44
CLDS Reference	B	10	11/19/2018 14:44:48	20.9	7.38	96.4	7.76	41861	26.90
CLDS Reference	C	10	11/19/2018 14:45:05	21.2	7.29	94.9	7.78	39809	25.44
CLDS Reference	D	10	11/19/2018 14:45:22	21.2	7.35	95.4	7.79	39271	25.06
CLDS Reference	E	10	11/19/2018 14:45:45	21.2	7.34	95.6	7.79	40032	25.60
Composite 2	A	10	11/19/2018 14:46:15	21.2	7.33	95.3	7.90	39763	25.41
Composite 2	B	10	11/19/2018 14:46:32	21.1	7.40	96.0	7.93	39388	25.14
Composite 2	C	10	11/19/2018 14:46:53	21.1	7.38	96.3	7.96	40905	26.22
Composite 2	D	10	11/19/2018 14:47:12	21.2	7.21	93.9	7.97	39911	25.51
Composite 2	E	10	11/19/2018 14:47:27	21.3	7.39	96.4	7.97	39886	25.50
Composite 3	A	10	11/19/2018 14:47:45	21.2	7.29	94.7	7.99	39628	25.31
Composite 3	B	10	11/19/2018 14:48:00	20.4	7.22	95.1	7.99	45975	29.87
Composite 3	C	10	11/19/2018 14:48:14	21.1	7.26	94.7	8.02	40853	26.18
Composite 3	D	10	11/19/2018 14:48:38	21.2	7.25	94.5	8.05	39948	25.54
Composite 3	E	10	11/19/2018 14:49:00	21.2	7.28	94.7	8.07	39663	25.34
Composite 4	A	10	11/19/2018 14:49:23	21.2	7.22	94.1	8.03	40129	25.67
Composite 4	B	10	11/19/2018 14:49:38	21.2	7.29	94.6	8.02	38958	24.84
Composite 4	C	10	11/19/2018 14:50:01	21.1	7.25	94.2	8.02	39780	25.42
Composite 4	D	10	11/19/2018 14:50:22	21.2	7.29	94.5	8.01	38945	24.83
Composite 4	E	10	11/19/2018 14:52:12	21.2	7.25	94.3	8.01	39407	25.16
Composite 5	A	10	11/19/2018 14:52:36	21.3	7.17	93.0	8.12	38619	24.60
Composite 5	B	10	11/19/2018 14:53:05	21.3	7.07	92.2	8.11	39789	25.43
Composite 5	C	10	11/19/2018 14:53:31	21.3	7.15	93.2	8.07	39797	25.43
Composite 5	D	10	11/19/2018 14:53:51	21.2	7.21	93.9	8.09	39770	25.41
Composite 5	E	10	11/19/2018 14:54:09	21.2	7.15	93.2	8.13	40056	25.62
Composite 6	A	10	11/19/2018 14:54:46	21.3	7.08	92.5	7.97	40411	25.87
Composite 6	B	10	11/19/2018 14:55:04	21.3	7.21	94.1	7.93	39896	25.50
Composite 6	C	10	11/19/2018 14:55:22	21.3	7.12	92.9	7.92	40108	25.65
Composite 6	D	10	11/19/2018 14:55:47	21.3	7.26	94.9	7.92	40492	25.93
Composite 6	E	10	11/19/2018 14:56:08	21.3	7.13	93.7	7.90	41502	26.64

STUDY: 31245
 CLIENT: AECOM
 PROJECT: New Haven Harbor FNP - 2018
 ASSAY: *Americamysis bahia* 10 Day Solid Phase Evaluation

TASK: Overlying Water Ammonia Summary
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and USEPA Am
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) and FLDEP (20
 Where: I = Ionic Strength $(19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$
 pK_a = ionization constant of ammonium ion in aqueous saline solution $(+9.245 + 0.116 \cdot Q$
 F_{NH_3} = fraction of UIA $(+1 / (1 + 10^{(R_{11} + 0.0324 \cdot (298 - P_{11}) + (0.0415 \cdot I) / (P_{11} - M_{11}))))$
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in F_{NH_3} assumed to be 1 atm

Sample ID	Day	ESI Code	Ammonia				Units	Sampled	Analyzed
			Total	Qual	Unionized	QLimit			
Laboratory Control	00	31245-100	0.15		0.0026	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
CLDS Reference Site	00	31245-101	ND		0.0022	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 2	00	31245-102	1.6		0.0413	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 3	00	31245-103	1.8		0.0493	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 4	00	31245-104	2.2		0.0602	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 5	00	31245-105	2.5		0.0684	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 6	00	31245-400	0.61		0.0164	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Laboratory Control	03	31245-200	0.63		0.0080	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
CLDS Reference Site	03	31245-201	0.13		0.0022	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 2	03	31245-202	3		0.0590	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 3	03	31245-203	1.6		0.0338	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 4	03	31245-204	1.8		0.0401	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 5	03	31245-205	3.4		0.0790	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 6	03	31245-206	ND		0.0024	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Laboratory Control	10	31245-300	0.56		0.0078	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
CLDS Reference Site	10	31245-301	0.15		0.0029	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 2	10	31245-302	0.21		0.0061	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 3	10	31245-303	0.16		0.0057	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 4	10	31245-304	0.31		0.0120	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 5	10	31245-305	0.21		0.0101	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 6	10	31245-306	ND		0.0034	0.1	mg/L as N	11/19/18 1100	11/20/18 1100

L	M	N	O	P	Q	R	S
temp (°C)	pH (SU)	salinity (ppt)	Tot NH3	Temp (°K)	I	pKa	F_{NH_3}
20.3	7.71	28.02	0.15	293.45	0.574544	9.311647	1.75%
20.0	7.82	28.42	0.1	293.15	0.582987	9.312626	2.19%
20.1	7.89	28.39	1.6	293.25	0.582354	9.312553	2.58%
20.0	7.92	28.72	1.8	293.15	0.589324	9.313362	2.74%
20.3	7.91	28.66	2.2	293.45	0.588056	9.313215	2.74%
20.6	7.90	28.57	2.5	293.75	0.586155	9.312994	2.74%
20.7	7.89	28.64	0.61	293.85	0.587634	9.313166	2.69%
21.2	7.54	28.88	0.63	294.35	0.592705	9.313754	1.27%
21.0	7.67	29.19	0.13	294.15	0.59926	9.314514	1.67%
21.1	7.74	29.75	3	294.25	0.611111	9.315889	1.97%
21.1	7.77	29.20	1.6	294.25	0.599471	9.314539	2.11%
21.2	7.79	29.09	1.8	294.35	0.597145	9.314269	2.23%
21.2	7.81	29.45	3.4	294.35	0.60476	9.315152	2.32%
21.3	7.82	30.09	0.1	294.45	0.618313	9.316724	2.39%
21.2	7.57	24.75	0.56	294.35	0.505783	9.303671	1.39%
20.9	7.73	25.44	0.15	294.05	0.520253	9.305349	1.94%
21.2	7.90	25.41	0.21	294.35	0.519624	9.305276	2.91%
21.2	7.99	25.31	0.16	294.35	0.517525	9.305033	3.56%
21.2	8.03	25.67	0.31	294.35	0.525081	9.305909	3.88%
21.3	8.12	24.60	0.21	294.45	0.50264	9.303306	4.79%
21.3	7.97	25.87	0.1	294.45	0.529282	9.306397	3.41%

DAY10 *Americamysis bahia* Sediment Assay Recovery

DATE: 11/19/18
 CLIENT: AECOM

STUDY: 31245
 PROJECT: New Haven Harbor

SAMPLE ID	REP	#LIVE ADULTS	INITIALS		SAMPLE ID	REP	#LIVE ADULTS	INITIALS
Laboratory Control	A			/	Composite 4	A	19	JTP
	B					B	18	
	C					C	18	
	D					D	17	
	E					E	19	↓
CLDS Reference Site	A			/	Composite 5	A	18	JTP
	B					B	19	↓
	C					C		
	D					D		
	E					E		
Composite 2	A	19	JTP	/	Composite 6	A		
	B	19				B		
	C	19	↓			C		
	D	18				D		
	E	17	↓			E		
Composite 3	A	17	JTP	/	Composite 6			
	B	19						
	C	18						
	D	20						
	E	17	↓					

DAY10 *Americamysis bahia* Sediment Assay Recovery

DATE: 11/19/18

STUDY: 31245

CLIENT: AECOM

PROJECT: New Haven Harbor

SAMPLE ID	REP	#LIVE ADULTS	INITIALS		SAMPLE ID	REP	#LIVE ADULTS	INITIALS
Laboratory Control	A	20	ASM	Composite 2	Composite 4	A		
	B	20	ASM			B		
	C	20	ASM			C		
	D	18	ASM			D		
	E	20	ASM			E		
CLDS Reference Site	A	2	ASM	Composite 5	A			
	B	6	ASM		B			
	C	15	ASM		C	20	km	
	D	20	km		D	18	↓	
	E	20	km		E	20	↓	
Composite 3	A			Composite 6	A	18	km	
	B				B	20	↓	
	C				C	20	↓	
	D				D	20	↓	
	E				E	18	↓	

DAY10 *Americamysis bahia* Sediment Assay Recovery

DATE: 11/19/18 STUDY: 31245
 CLIENT: AECOM PROJECT: New Haven Harbor

SAMPLE ID	REP	#LIVE ADULTS	INITIALS		SAMPLE ID	REP	#LIVE ADULTS	INITIALS
Laboratory Control	A			/	Composite 4	A		
	B					B		
	C					C		
	D					D		
	E					E		
CLDS Reference Site	A				Composite 5	A		
	B					B		
	C					C	20	ke
	D	20	ke			D	20 ¹⁸ 11/19/18	ke
	E	20	↓			E	20	ke
Composite 2	A	19	JTP	Composite 6	A	18	ke	
	B	19	↓		B	20	↓	
	C	19	↓		C	20	↓	
	D	18	↓		D	20	↓	
	E	17	↓		E	18	↓	
Composite 3	A	17	JTP					
	B	19						
	C	18						
	D	20						
	E							

CETIS Test Data Worksheet

Report Date: 20 Nov-18 11:03 (p 1 of 1)
Test Code/ID: 03-6453-7833/31245Ab

Americamysis bahia 10-Day Survival Sediment Test			EnviroSystems, Inc.		
Start Date: 09 Nov-18 12:00	Species: Americamysis bahia	Sample Code: 31245-000			
End Date: 19 Nov-18 12:00	Protocol: EPA/600/R-94/025 (1994)	Sample Source: New Haven Harbor 2018			
Sample Date: 09 Nov-18	Material: Laboratory Control Sediment	Sample Station: Laboratory Control (Ab)			

Sample	Rep	Pos	# Exposed	# Survived	Notes
31245-000	1	5	20	20	
31245-000	2	9	20	20	
31245-000	3	21	20	20	
31245-000	4	25	20	18	
31245-000	5	33	20	20	
31242-008	1	4	20	2	
31242-008	2	12	20	6	
31242-008	3	19	20	15	
31242-008	4	28	20	20	
31242-008	5	32	20	20	
31243-101	1	3	20	19	
31243-101	2	8	20	19	
31243-101	3	17	20	19	
31243-101	4	26	20	18	
31243-101	5	31	20	17	
31243-102	1	7	20	17	
31243-102	2	13	20	19	
31243-102	3	15	20	18	
31243-102	4	24	20	20	
31243-102	5	34	20	17	
31243-103	1	2	20	19	
31243-103	2	14	20	18	
31243-103	3	20	20	18	
31243-103	4	23	20	17	
31243-103	5	30	20	19	
31243-104	1	6	20	18	
31243-104	2	11	20	19	
31243-104	3	16	20	20	
31243-104	4	22	20	18	
31243-104	5	29	20	20	
31243-105	1	1	20	18	
31243-105	2	10	20	20	
31243-105	3	18	20	20	
31243-105	4	27	20	20	
31243-105	5	35	20	18	

CETIS Summary Report

Report Date: 20 Nov-18 11:16 (p 1 of 1)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test	EnviroSystems, Inc.
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Batch ID: 15-7241-4783	Test Type: Survival	Analyst: Nancy Roka
Start Date: 09 Nov-18 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Not Applicable
Ending Date: 19 Nov-18 12:00	Species: Americamysis bahia	Brine: Not Applicable
Duration: 10d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31245-000	15-9267-6009	09 Nov-18	09 Nov-18	12h	AECOM	Dredged Sediment Evalu
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h		
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	15d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	14d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	14d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	15d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	16d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31245-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Ab)	
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
03-8215-3727	Proportion Survived	Unequal Variance t Two-Sample Test	0.0652	31242-008 passed proportion survived
07-5150-4128	Proportion Survived	Unequal Variance t Two-Sample Test	0.8787	31243-101 passed proportion survived
08-5824-7225	Proportion Survived	Equal Variance t Two-Sample Test	0.8848	31243-102 passed proportion survived
10-0056-8620	Proportion Survived	Unequal Variance t Two-Sample Test	0.8665	31243-103 passed proportion survived
07-8869-3920	Proportion Survived	Unequal Variance t Two-Sample Test	0.9093	31243-104 passed proportion survived
00-9012-4393	Proportion Survived	Equal Variance t Two-Sample Test	0.9368	31243-105 passed proportion survived

Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31245-000	LC	5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	0.00%
31242-008	RS	5	0.630	0.119	1.000	0.100	1.000	0.184	0.412	65.35%	35.71%
31243-101		5	0.920	0.864	0.976	0.850	0.950	0.020	0.045	4.86%	6.12%
31243-102		5	0.910	0.829	0.991	0.850	1.000	0.029	0.065	7.16%	7.14%
31243-103		5	0.910	0.858	0.962	0.850	0.950	0.019	0.042	4.60%	7.14%
31243-104		5	0.950	0.888	1.000	0.900	1.000	0.022	0.050	5.26%	3.06%
31243-105		5	0.960	0.892	1.000	0.900	1.000	0.025	0.055	5.71%	2.04%

Proportion Survived Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31245-000	LC	1.000	1.000	1.000	0.900	1.000
31242-008	RS	0.100	0.300	0.750	1.000	1.000
31243-101		0.950	0.950	0.950	0.900	0.850
31243-102		0.850	0.950	0.900	1.000	0.850
31243-103		0.950	0.900	0.900	0.850	0.950
31243-104		0.900	0.950	1.000	0.900	1.000
31243-105		0.900	1.000	1.000	1.000	0.900

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 1 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 03-8215-3727		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:15		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31245-000	15-9267-6009	09 Nov-18	09 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31245-000	Laboratory Control Sediment	New Haven Harbor 2018		Laboratory Control (Ab)							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31242-008 passed proportion survived					35.53%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Lab Control Sedime		Reference Sed	1.9	2.13	0.498	4	CDF	0.0652	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.87	2.29	0.3890	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.491941		0.491941	1	3.61	0.0941	Non-Significant Effect				
Error	1.09147		0.136434	8							
Total	1.58341			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			30	23.2	0.0061	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.904	0.741	0.2425	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31245-000	LC	5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	0.00%
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	35.71%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31245-000	LC	5	1.42	1.3	1.53	1.46	1.25	1.46	0.0419	6.62%	0.00%
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	31.31%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31245-000	LC	1.000	1.000	1.000	0.900	1.000					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31245-000	LC	1.46	1.46	1.46	1.25	1.46					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 2 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 07-5150-4128		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:16		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	15d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-101 passed proportion survived					66.46%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-1.37	2.13	0.496	4	CDF	0.8787	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.88	2.29	0.3761	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.25341		0.25341	1	1.88	0.2080	Non-Significant Effect				
Error	1.08079		0.135098	8							
Total	1.3342			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			43.1	23.2	0.0030	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.915	0.741	0.3193	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	0.00%
31243-101		5	0.920	0.864	0.976	0.950	0.850	0.950	0.020	4.86%	-46.03%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	0.00%
31243-101		5	1.29	1.19	1.39	1.35	1.17	1.35	0.035	6.06%	-32.71%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
31243-101		0.950	0.950	0.950	0.900	0.850					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					
31243-101		1.35	1.35	1.35	1.25	1.17					

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 3 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 08-5824-7225		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:16		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-102 passed proportion survived					58.89%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.3	1.86	0.439	8	CDF	0.8848	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.85	2.29	0.4192	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.235063		0.235063	1	1.68	0.2305	Non-Significant Effect				
Error	1.11632		0.13954	8							
Total	1.35138			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			17.6	23.2	0.0167	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.948	0.741	0.6467	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	0.00%
31243-102		5	0.910	0.829	0.991	0.900	0.850	1.000	0.029	7.16%	-44.44%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	0.00%
31243-102		5	1.28	1.13	1.43	1.25	1.17	1.46	0.0548	9.57%	-31.51%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
31243-102		0.850	0.950	0.900	1.000	0.850					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					
31243-102		1.17	1.35	1.25	1.46	1.17					

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 4 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 10-0056-8620		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:16		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-103 passed proportion survived					66.37%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-1.29	2.13	0.495	4	CDF	0.8665	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.88	2.29	0.3726	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.223697		0.223697	1	1.66	0.2336	Non-Significant Effect				
Error	1.07786		0.134733	8							
Total	1.30156			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			49	23.2	0.0024	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.917	0.741	0.3347	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	0.00%
31243-103		5	0.910	0.858	0.962	0.900	0.850	0.950	0.019	4.60%	-44.44%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	0.00%
31243-103		5	1.27	1.18	1.36	1.25	1.17	1.35	0.0328	5.77%	-30.74%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
31243-103		0.950	0.900	0.900	0.850	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					
31243-103		1.35	1.25	1.25	1.17	1.35					

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 5 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 07-8869-3920		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:16		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	15d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Angular (Corrected)	C > T		31243-104 passed proportion survived				67.03%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-1.62	2.13	0.5	4	CDF	0.9093	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.86	2.29	0.3997	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.359022		0.359022	1	2.61	0.1448	Non-Significant Effect				
Error	1.10033		0.137541	8							
Total	1.45935			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			24	23.2	0.0094	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.937	0.741	0.5218	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	0.00%
31243-104		5	0.950	0.888	1.000	0.950	0.900	1.000	0.022	5.26%	-50.79%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	0.00%
31243-104		5	1.35	1.22	1.48	1.35	1.25	1.46	0.0469	7.76%	-38.94%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
31243-104		0.900	0.950	1.000	0.900	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					
31243-104		1.25	1.35	1.46	1.25	1.46					

CETIS Analytical Report

Report Date: 20 Nov-18 11:16 (p 6 of 6)
Test Code: 31245Ab | 03-6453-7833

Americamysis bahia 10-Day Survival Sediment Test							EnviroSystems, Inc.				
Analysis ID: 00-9012-4393		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:16		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	16d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-105 passed proportion survived					58.69%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-1.71	1.86	0.438	8	CDF	0.9368	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.86	2.29	0.4103	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.403312		0.403312	1	2.91	0.1265	Non-Significant Effect				
Error	1.10906		0.138633	8							
Total	1.51237			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			20	23.2	0.0132	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.925	0.741	0.3966	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.630	0.119	1.000	0.750	0.100	1.000	0.184	65.35%	0.00%
31243-105		5	0.960	0.892	1.000	1.000	0.900	1.000	0.025	5.71%	-52.38%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.973	0.335	1.61	1.05	0.322	1.46	0.23	52.80%	0.00%
31243-105		5	1.37	1.23	1.52	1.46	1.25	1.46	0.0514	8.35%	-41.27%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.100	0.300	0.750	1.000	1.000					
31243-105		0.900	1.000	1.000	1.000	0.900					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.322	0.58	1.05	1.46	1.46					
31243-105		1.25	1.46	1.46	1.46	1.25					

10 DAY SEDIMENT ASSAY

Study #:	31244	Water Bath ID	6
Project:	New Haven Harbor	Client:	AECOM

Summary of Test Conditions

Exposure	Species Used
Test Mode: In-Life: Static renewal 1 volume replacement daily Length of Assay: 10 days	(Check box for all that apply) <input type="checkbox"/> Mysid Shrimp (<i>Americamysis bahia</i>) <input checked="" type="checkbox"/> Marine Amphipod (<i>Leptocheirus plumulosus</i>)

Water Quality Parameters

Salinity: <i>A. bahia</i> : 30 ± 2 ppt <i>L. plumulosus</i> : 20 ± 2 ppt pH: 7.8 ± 0.5	Photoperiod: 16 hour light, 8 hour dark Temperature: 20 ± 1 °C
---	--

Test Chamber	Solution & Sediment Volume
(Check box for all that apply) <input checked="" type="checkbox"/> 1000 mL beaker <input type="checkbox"/> other _____	(Check box for all that apply) <input checked="" type="checkbox"/> 2 cm (~175mL) homogenized sediment <input type="checkbox"/> ~800 mL overlying water <input checked="" type="checkbox"/> other <u>725 mL OW</u>

Replicate Information

A. bahia and *L. plumulosus*:

- 5 Reps per treatment for survival endpoint
- 1 surrogate replicate for water quality (*Lp* only)
- 20 organisms per chamber
- Continuous aeration from start

Cleaning	Treatments
Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed then rinsed with deionized water (EPA 2002).	Laboratory Control, Reference Site, and Site Sediments

Feeding

<i>A. bahia</i>: Daily feedings (2x) of newly hatched, <24 hour old <i>Artemia nauplii</i>	<i>L. plumulosus</i>: NONE
--	--

Date: 11/09/18

Initial JTP

③ LHM 11/10/18
19LP ARO 11/08/18



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Leptocleirus plumulosus

Source: Lab reared Hatchery reared _____ Field collected _____

Hatch date 10/20/18 Receipt date _____

Lot number 11 08 18 LP Strain A, 20

Brood origination Chesapeake Bay, VA

II. Water Quality

Temperature 24 °C Salinity ~20 ppt D.O. SAT ppm

pH ~8.0 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating _____ Flow through _____ Static renewal

DIET: Flake food Phytoplankton _____ Trout chow

Artemia _____ Rotifers _____ YCT _____ Other "GORG"

Prophylactic treatments: _____

Comments: 2-4 mm long

IV. Shipping Information

Client: ESI # of Organisms 11000

Carrier: Pick-up Date shipped 11/8/18

Biologist: [Signature]

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

DAY10 Sediment Assay Data Summary

STUDY #: 31244 WATER BATH ID: 6
 CLIENT: AECOM PROJECT: New Haven Harbor

INITIATION RECORD			
Species:	Leptocheirus plumulosus	Counted by:	JTP
Organism Lot ID:	19LPAR0110818	Added by:	JTP
Number of Organisms added to each vessel:	20	Temp Data Logger No:	010015860

DAILY LOG				
Day	Daily Water Quality Performed Date / Initials	Renew Daily (One Exchange)	Biological Observations ² (N= Normal)	Overlying and Pore water collected for NH ₃
0*	11/09/18 BV	✓	N	BG
1	11/10/18 BV	✓	N	
2	11/11/18 MS	✓	N	
3	11/12/18 MS	✓	N	MS
4	11/13/18 MS	✓	N	
5	11/14/18 MS	✓	N	
6	11/15/18 MS	✓	N	
7	11/16/18 DF	✓	N	
8	11/17/18 PL	✓	N	
9	11/18/18 MS	✓	N	
10*	11/19/18 MS	✓	N	MS

*On Day 0 and Day 10 water quality parameters were performed on all beakers.

²Organisms were monitored daily. Due to the study design and the nature of each sample matrix it may be difficult to achieve accurate counts until termination. Healthy vessels (N=normal) are characterized by an abundance of burrow-openings on the sediment surface and turbid water from amphipod activity, unless otherwise noted.

Comments

Pore Water Quality Record

Study: 31244
Client: AECOM
Project: New Haven Harbor

Day 0 Pore Water Quality

Sample	Salinity (ppt)	Temperature (C)	pH value
Laboratory Control Sediment	20	20.9	5.82
Reference Site Sediment	22	21.0	7.75
Composite 2	24	21	7.65
Composite 3	20	21.2	7.73
Composite 4	20	21.7	7.74
Composite 5	21	21.2	7.60
Date: 11/11/18 Composite 6			
Initial: BG pH Meter ID: MLO2 ²⁰ 21.1			
Salinity Meter ID: MLO2			

Day 3 Pore Water Quality

Sample	Salinity (ppt)	Temperature (C)	pH value
Laboratory Control Sediment	19	21.2	6.10
Reference Site Sediment	21	21.1	7.63
Composite 2	22	21.0	7.57
Composite 3	20	20.9	7.44
Composite 4	20	21.0	7.58
Composite 5	20	21.1	7.39
Date: 11/12/18 Composite 6			
Initial: MS pH Meter ID: MLO1 ²¹ 21.1			
Salinity Meter ID: ESS MLO81			

Day 10 Pore Water Quality

Sample	Salinity (ppt)	Temperature (C)	pH value
Laboratory Control Sediment	20	21.2	6.60
Reference Site Sediment	21	21.0	7.41
Composite 2	21	21.2	7.24
Composite 3	21	21.3	7.26
Composite 4	21	21.1	7.31
Composite 5	20	21.1	6.93
Date: 11/14/18 Comp 6			
Initial: MS pH Meter ID: MLO1 ²⁰ 20.9			
Salinity Meter ID: EST #1			

STUDY: 31244
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.53	93.6	7.70	31025	19.33
Minimum:	20.0	4.87	62.1	6.30	27874	17.18
Maximum:	21.7	8.13	99.1	8.03	37145	23.57

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	Surrogate	00	11/9/2018 17:19:28	20.2	8.13	99.1	7.78	29803	18.50
Laboratory Control	A	00	11/9/2018 17:20:07	20.2	8.13	99.1	7.76	29687	18.42
Laboratory Control	B	00	11/9/2018 17:20:31	20.3	8.09	98.6	7.74	29543	18.32
Laboratory Control	C	00	11/9/2018 17:20:53	20.3	8.07	98.5	7.74	29548	18.32
Laboratory Control	D	00	11/9/2018 17:21:19	20.4	7.90	96.6	7.74	29629	18.38
Laboratory Control	E	00	11/9/2018 17:21:42	20.4	7.99	97.6	7.74	29582	18.34
CLDS Reference	Surrogate	00	11/9/2018 17:22:04	20.0	7.95	96.8	7.78	30553	19.01
CLDS Reference	A	00	11/9/2018 17:22:22	20.2	8.00	97.7	7.82	30063	18.67
CLDS Reference	B	00	11/9/2018 17:22:44	20.4	7.93	97.1	7.85	29891	18.55
CLDS Reference	C	00	11/9/2018 17:23:21	20.3	7.97	97.6	7.86	30021	18.64
CLDS Reference	D	00	11/9/2018 17:23:55	20.4	7.92	96.9	7.86	29969	18.61
CLDS Reference	E	00	11/9/2018 17:24:33	20.4	8.02	98.4	7.86	30056	18.67
Composite 2	Surrogate	00	11/9/2018 17:25:05	20.3	7.70	94.3	7.93	30223	18.78
Composite 2	A	00	11/9/2018 17:25:31	20.3	7.92	96.8	7.91	29959	18.60
Composite 2	B	00	11/9/2018 17:25:54	20.4	7.94	97.2	7.90	30003	18.63
Composite 2	C	00	11/9/2018 17:26:22	20.4	7.91	97.0	7.91	30000	18.63
Composite 2	D	00	11/9/2018 17:26:36	20.4	7.95	97.5	7.91	30008	18.63
Composite 2	E	00	11/9/2018 17:27:08	20.5	7.90	97.0	7.90	29971	18.61
Composite 3	Surrogate	00	11/9/2018 17:27:36	20.3	7.82	95.7	7.89	29940	18.59
Composite 3	A	00	11/9/2018 17:27:54	20.3	7.93	97.0	7.91	29974	18.61
Composite 3	B	00	11/9/2018 17:28:14	20.3	7.89	96.5	7.92	29950	18.59
Composite 3	C	00	11/9/2018 17:28:32	20.4	7.86	96.2	7.92	29987	18.62
Composite 3	D	00	11/9/2018 17:28:45	20.5	7.89	96.9	7.92	29964	18.60
Composite 3	E	00	11/9/2018 17:29:08	20.5	7.89	96.9	7.92	29971	18.61
Composite 4	Surrogate	00	11/9/2018 17:29:36	20.3	7.65	93.5	7.91	29994	18.62
Composite 4	A	00	11/9/2018 17:30:05	20.4	7.97	97.5	7.93	29856	18.53
Composite 4	B	00	11/9/2018 17:30:23	20.3	7.99	97.7	7.93	29885	18.55
Composite 4	C	00	11/9/2018 17:30:46	20.4	7.95	97.4	7.93	29845	18.52
Composite 4	D	00	11/9/2018 17:31:10	20.5	7.84	96.2	7.95	29884	18.55
Composite 4	E	00	11/9/2018 17:31:30	20.6	7.80	95.8	7.93	29965	18.60
Composite 5	Surrogate	00	11/9/2018 17:31:56	20.3	7.73	94.8	7.90	30716	19.12
Composite 5	A	00	11/9/2018 17:32:17	20.3	7.85	96.2	7.92	30468	18.95
Composite 5	B	00	11/9/2018 17:32:41	20.3	7.99	98.0	7.93	30316	18.84
Composite 5	C	00	11/9/2018 17:33:12	20.3	7.94	97.5	7.91	30657	19.08
Composite 5	D	00	11/9/2018 17:33:36	20.4	7.90	97.2	7.91	30818	19.19
Composite 5	E	00	11/9/2018 17:33:59	20.5	7.90	97.4	7.91	30822	19.19
Composite 6	Surrogate	00	11/9/2018 17:34:32	20.4	7.82	96.3	7.89	31054	19.35
Composite 6	A	00	11/9/2018 17:35:01	20.4	7.91	97.4	7.89	31237	19.47
Composite 6	B	00	11/9/2018 17:35:19	20.4	7.87	96.7	7.91	30548	19.00
Composite 6	C	00	11/9/2018 17:35:41	20.4	8.03	98.7	7.91	30563	19.01
Composite 6	D	00	11/9/2018 17:36:04	20.5	7.93	97.8	7.90	31028	19.33
Composite 6	E	00	11/9/2018 17:36:22	20.5	7.91	97.6	7.90	30990	19.30
Laboratory Control	Surrogate	01	11/10/2018 16:08:07	21.4	4.87	62.1	7.45	31444	19.61
CLDS Reference	Surrogate	01	11/10/2018 16:08:31	21.3	7.30	93.8	7.66	33995	21.37
Composite 2	Surrogate	01	11/10/2018 16:08:52	21.5	7.28	93.4	7.87	32621	20.41
Composite 3	Surrogate	01	11/10/2018 16:09:13	21.6	7.01	89.9	7.85	32092	20.05
Composite 4	Surrogate	01	11/10/2018 16:09:34	21.6	7.22	92.6	7.86	32198	20.12

STUDY: 31244
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.53	93.6	7.70	31025	19.33
Minimum:	20.0	4.87	62.1	6.30	27874	17.18
Maximum:	21.7	8.13	99.1	8.03	37145	23.57

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	Surrogate	01	11/10/2018 16:09:55	21.7	7.06	90.9	7.85	32875	20.59
Composite 6	Surrogate	01	11/10/2018 16:10:15	21.7	7.17	92.5	7.86	33337	20.91
Laboratory Control	Surrogate	02	11/11/2018 10:48:33	21.0	7.44	92.7	6.32	31543	19.68
CLDS Reference	Surrogate	02	11/11/2018 10:49:04	20.8	7.41	92.7	7.05	33603	21.10
Composite 2	Surrogate	02	11/11/2018 10:49:26	21.0	7.47	93.5	7.49	32938	20.64
Composite 3	Surrogate	02	11/11/2018 10:49:49	21.1	7.13	89.2	7.57	32002	19.99
Composite 4	Surrogate	02	11/11/2018 10:50:12	21.1	7.30	91.4	7.62	32172	20.11
Composite 5	Surrogate	02	11/11/2018 10:50:26	21.2	7.37	92.2	7.65	31671	19.76
Composite 6	Surrogate	02	11/11/2018 10:50:52	21.1	7.23	92.2	7.69	36468	23.09
Laboratory Control	Surrogate	03	11/12/2018 10:30:38	21.1	7.00	86.4	6.30	30009	18.63
CLDS Reference	Surrogate	03	11/12/2018 10:31:06	20.8	7.41	91.4	6.52	31525	19.67
Composite 2	Surrogate	03	11/12/2018 10:31:37	21.0	7.20	90.0	7.26	33548	21.06
Composite 3	Surrogate	03	11/12/2018 10:32:04	21.1	7.23	89.3	7.48	30460	18.94
Composite 4	Surrogate	03	11/12/2018 10:32:27	21.1	7.30	90.1	7.54	30451	18.93
Composite 5	Surrogate	03	11/12/2018 10:32:44	21.1	7.35	90.8	7.59	30170	18.74
Composite 6	Surrogate	03	11/12/2018 10:33:07	21.2	7.39	92.0	7.62	31850	19.89
Laboratory Control	Surrogate	04	11/13/2018 08:57:18	21.2	7.30	91.1	6.70	29266	18.12
CLDS Reference	Surrogate	04	11/13/2018 08:57:54	21.1	7.39	92.7	7.36	31077	19.36
Composite 2	Surrogate	04	11/13/2018 08:58:17	21.2	7.30	92.3	7.57	32620	20.42
Composite 3	Surrogate	04	11/13/2018 08:58:38	21.3	7.35	92.0	7.65	29635	18.37
Composite 4	Surrogate	04	11/13/2018 08:59:00	21.3	7.29	91.3	7.67	29740	18.44
Composite 5	Surrogate	04	11/13/2018 08:59:17	21.4	7.20	90.5	7.69	30281	18.81
Composite 6	Surrogate	04	11/13/2018 08:59:41	21.4	7.23	91.2	7.72	30881	19.22
Laboratory Control	Surrogate	05	11/14/2018 10:53:45	21.0	7.30	91.5	6.52	33030	20.70
CLDS Reference	Surrogate	05	11/14/2018 10:54:06	20.7	7.54	94.7	7.16	34867	21.98
Composite 2	Surrogate	05	11/14/2018 10:54:28	20.9	7.27	91.6	7.50	34956	22.04
Composite 3	Surrogate	05	11/14/2018 10:55:11	21.1	7.18	90.2	7.69	33257	20.86
Composite 4	Surrogate	05	11/14/2018 10:55:27	21.0	7.37	92.6	7.71	33515	21.04
Composite 5	Surrogate	05	11/14/2018 10:55:45	21.1	7.14	90.0	7.78	33695	21.16
Composite 6	Surrogate	05	11/14/2018 10:56:01	21.1	7.31	92.2	7.79	33891	21.30
Laboratory Control	Surrogate	06	11/15/2018 09:58:32	20.7	7.63	93.7	6.88	32385	20.26
CLDS Reference	Surrogate	06	11/15/2018 09:58:49	20.5	7.75	95.2	7.21	33334	20.92
Composite 2	Surrogate	06	11/15/2018 09:59:22	20.7	7.54	93.6	7.56	35554	22.46
Composite 3	Surrogate	06	11/15/2018 09:59:41	20.9	7.45	91.9	7.67	32521	20.35
Composite 4	Surrogate	06	11/15/2018 10:00:17	20.8	7.40	91.1	7.70	32455	20.31
Composite 5	Surrogate	06	11/15/2018 10:00:40	20.9	7.40	91.3	7.82	32399	20.27
Composite 6	Surrogate	06	11/15/2018 10:01:09	20.9	7.60	93.8	7.77	32479	20.32
Laboratory Control	Surrogate	07	11/16/2018 11:33:37	20.9	7.11	91.6	7.20	34050	21.41
CLDS Reference	Surrogate	07	11/16/2018 11:33:57	20.8	7.13	92.2	7.45	35366	22.32
Composite 2	Surrogate	07	11/16/2018 11:34:25	21.0	7.01	91.6	7.69	37145	23.57
Composite 3	Surrogate	07	11/16/2018 11:34:43	21.1	6.99	90.5	7.83	34189	21.50
Composite 4	Surrogate	07	11/16/2018 11:35:05	21.1	7.03	90.9	7.86	34197	21.51

STUDY: 31244
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.53	93.6	7.70	31025	19.33
Minimum:	20.0	4.87	62.1	6.30	27874	17.18
Maximum:	21.7	8.13	99.1	8.03	37145	23.57

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	Surrogate	07	11/16/2018 11:35:26	21.1	6.90	89.2	8.02	33807	21.24
Composite 6	Surrogate	07	11/16/2018 11:35:48	21.2	7.07	91.5	7.93	33731	21.19
Laboratory Control	Surrogate	08	11/17/2018 10:25:04	21.1	7.43	93.6	7.59	32061	20.03
CLDS Reference	Surrogate	08	11/17/2018 10:25:24	21.0	7.37	92.9	7.68	32707	20.48
Composite 2	Surrogate	08	11/17/2018 10:25:58	21.1	7.26	92.3	7.81	34186	21.50
Composite 3	Surrogate	08	11/17/2018 10:26:17	21.2	7.09	89.4	7.88	31829	19.87
Composite 4	Surrogate	08	11/17/2018 10:26:37	21.1	7.40	93.2	7.90	31738	19.81
Composite 5	Surrogate	08	11/17/2018 10:26:54	21.2	7.22	91.6	7.99	33327	20.91
Composite 6	Surrogate	08	11/17/2018 10:27:24	21.2	7.28	92.4	7.89	33226	20.84
Laboratory Control	Surrogate	09	11/18/2018 10:44:51	20.7	7.21	88.3	6.71	29811	18.50
CLDS Reference	Surrogate	09	11/18/2018 10:45:07	20.6	7.73	94.9	7.05	30643	19.07
Composite 2	Surrogate	09	11/18/2018 10:45:29	20.8	7.64	94.8	7.46	32592	20.40
Composite 3	Surrogate	09	11/18/2018 10:45:45	20.9	7.59	93.4	7.63	29904	18.56
Composite 4	Surrogate	09	11/18/2018 10:45:58	20.8	7.65	93.9	7.69	29869	18.54
Composite 5	Surrogate	09	11/18/2018 10:46:19	20.9	7.47	92.4	7.85	31120	19.39
Composite 6	Surrogate	09	11/18/2018 10:46:42	21.0	7.60	94.0	7.76	30947	19.27
Laboratory Control	Surrogate	10	11/19/2018 10:42:29	20.8	7.50	92.6	7.00	29464	18.26
Laboratory Control	A	10	No data ^a						
Laboratory Control	B	10	No data ^a						
Laboratory Control	C	10	No data ^a						
Laboratory Control	D	10	No data ^a						
Laboratory Control	E	10	No data ^a						
CLDS Reference	Surrogate	10	11/19/2018 10:42:45	20.8	7.44	92.1	7.17	30186	18.75
CLDS Reference	A	10	No data ^a						
CLDS Reference	B	10	No data ^a						
CLDS Reference	C	10	No data ^a						
CLDS Reference	D	10	No data ^a						
CLDS Reference	E	10	No data ^a						
Composite 2	Surrogate	10	11/19/2018 10:43:07	20.8	7.44	93.1	7.46	32999	20.68
Composite 2	A	10	11/19/2018 13:50:03	21.1	7.00	87.2	7.74	29570	18.33
Composite 2	B	10	11/19/2018 13:50:26	21.1	7.07	88.1	7.79	29302	18.15
Composite 2	C	10	11/19/2018 13:50:43	21.1	7.09	88.4	7.82	29424	18.23
Composite 2	D	10	11/19/2018 13:51:06	21.1	7.09	88.2	7.85	29333	18.17
Composite 2	E	10	11/19/2018 13:51:20	21.2	7.08	88.2	7.85	29386	18.20
Composite 3	Surrogate	10	11/19/2018 10:43:25	21.0	7.39	91.6	7.59	29391	18.21
Composite 3	A	10	11/19/2018 13:51:42	21.0	7.64	95.2	7.89	29864	18.53
Composite 3	B	10	11/19/2018 13:52:05	21.1	7.56	94.1	7.89	29503	18.28
Composite 3	C	10	11/19/2018 13:52:22	21.0	7.68	95.6	7.90	29522	18.30
Composite 3	D	10	11/19/2018 13:52:46	21.2	7.65	95.4	7.89	29303	18.15
Composite 3	E	10	11/19/2018 13:53:09	21.2	7.60	94.9	7.94	29614	18.36
Composite 4	Surrogate	10	11/19/2018 10:43:44	21.0	7.46	92.5	7.66	29432	18.24
Composite 4	A	10	11/19/2018 13:53:29	21.1	7.59	94.3	7.94	29007	17.95
Composite 4	B	10	11/19/2018 13:53:52	21.0	7.69	95.9	7.95	30001	18.62
Composite 4	C	10	11/19/2018 13:54:15	21.1	7.68	95.7	7.94	29691	18.41
Composite 4	D	10	11/19/2018 13:54:37	21.2	7.62	95.5	8.00	30480	18.95

STUDY: 31244
CLIENT: AECOM
PROJECT: New Haven Harbor FNP - 2018
ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	20.9	7.53	93.6	7.70	31025	19.33
Minimum:	20.0	4.87	62.1	6.30	27874	17.18
Maximum:	21.7	8.13	99.1	8.03	37145	23.57

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	E	10	11/19/2018 13:55:08	21.2	7.50	94.4	8.02	31502	19.65
Composite 5	Surrogate	10	11/19/2018 10:43:58	21.1	7.34	90.7	7.75	28145	17.36
Composite 5	A	10	11/19/2018 13:55:34	21.1	7.70	95.5	8.03	28398	17.53
Composite 5	B	10	11/19/2018 13:56:01	21.1	7.71	95.9	8.02	29118	18.02
Composite 5	C	10	11/19/2018 13:56:19	21.2	7.50	93.2	8.02	28548	17.63
Composite 5	D	10	11/19/2018 13:56:36	21.2	7.72	95.8	8.01	28119	17.34
Composite 5	E	10	11/19/2018 13:57:04	21.3	7.66	95.2	8.01	28301	17.47
Composite 6	Surrogate	10	11/19/2018 10:44:16	21.1	7.47	92.3	7.72	27874	17.18
Composite 6	A	10	11/19/2018 13:57:33	21.2	7.74	96.1	7.91	28249	17.43
Composite 6	B	10	11/19/2018 13:58:02	21.2	7.75	96.6	7.88	29497	18.28
Composite 6	C	10	11/19/2018 13:58:17	21.2	7.77	96.7	7.88	28644	17.70
Composite 6	D	10	11/19/2018 13:58:39	21.3	7.76	96.4	7.86	28085	17.32
Composite 6	E	10	11/19/2018 13:58:59	21.3	7.77	96.6	7.85	28272	17.45

Notes:

^a Water quality data are missing for replicates A through E. See Sectionc 3.3 for a discussion of the deviation.

STUDY: 31244
 CLIENT: AECOM
 PROJECT: New Haven Harbor FNP - 2018
 ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation

TASK: Overlying Water Ammonia Summary
 METHOD: SM 4500-NH3 G

Attachment 2 - Formulas Used to Derive Un-ionized Ammonia (UIA) Fractions and USEPA Am
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) and FLDEP (20
 Where: I = Ionic Strength $(19.9273 \cdot N11) / (1000 - 1.005109 \cdot N11)$
 $pKa = \text{ionization constant of ammonium ion in aqueous saline solution } (+9.245 + 0.116 \cdot Q1$
 $F_{NH3} = \text{fraction of UIA } (+1 / (1 + 10^{(R11 + 0.0324 \cdot (298 - P11) + (0.0415 \cdot 1) / P11) - M11)))$
 Tot NH3 = total ammonia, or QLimit if ND
 pressure in FNH3 assumed to be 1 atm

Sample ID	Day	ESI Code	Ammonia				Units	Sampled	Analyzed
			Total	Qual	Unionized	QLimit			
Laboratory Control	00	31244-100	ND		0.0021	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
CLDS Reference Site	00	31244-101	ND		0.0021	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 2	00	31244-102	4.3		0.1298	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 3	00	31244-103	2.1		0.0580	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 4	00	31244-104	2.2		0.0636	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 5	00	31244-105	2		0.0564	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 6	00	31244-400	0.68		0.0189	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Laboratory Control	03	31244-200	0.47		0.0004	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
CLDS Reference Site	03	31244-201	ND		0.0001	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 2	03	31244-202	5.7		0.0392	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 3	03	31244-203	1.6		0.0185	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 4	03	31244-204	1.7		0.0226	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 5	03	31244-205	2.6		0.0387	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 6	03	31244-214	0.61		0.0097	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Laboratory Control	10	31244-300	0.27		0.0010	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
CLDS Reference Site	10	31244-301	ND		0.0006	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 2	10	31244-302	0.18		0.0019	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 3	10	31244-303	ND		0.0015	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 4	10	31244-304	ND		0.0017	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 5	10	31244-305	ND		0.0022	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 6	10	31244-314	ND		0.0020	0.1	mg/L as N	11/19/18 1100	11/20/18 1100

L	M	N	O	P	Q	R	S
temp (°C)	pH (SU)	salinity (ppt)	Tot NH3	Temp (°K)	I	pKa	F _{NH3}
20.2	7.78	18.50	0.1	293.35	0.37564	9.288574	2.14%
20.0	7.78	19.01	0.1	293.15	0.386197	9.289799	2.11%
20.3	7.93	18.78	4.3	293.45	0.381435	9.289246	3.02%
20.3	7.89	18.59	2.1	293.45	0.377502	9.28879	2.76%
20.3	7.91	18.62	2.2	293.45	0.378123	9.288862	2.89%
20.3	7.90	19.12	2	293.45	0.388476	9.290063	2.82%
20.4	7.89	19.35	0.68	293.55	0.393241	9.290616	2.77%
21.1	6.30	18.63	0.47	294.25	0.37833	9.288886	0.08%
20.8	6.52	19.67	0.1	293.95	0.399876	9.291386	0.12%
21.0	7.26	21.06	5.7	294.15	0.428744	9.294734	0.69%
21.1	7.48	18.94	1.6	294.25	0.384747	9.289631	1.16%
21.1	7.54	18.93	1.7	294.25	0.38454	9.289607	1.33%
21.1	7.59	18.74	2.6	294.25	0.380607	9.28915	1.49%
21.2	7.62	19.89	0.61	294.35	0.404439	9.291915	1.59%
20.8	7.00	18.26	0.27	293.95	0.370676	9.287998	0.38%
20.8	7.17	18.75	0.1	293.95	0.380814	9.289174	0.56%
20.8	7.46	20.68	0.18	293.95	0.420844	9.293818	1.07%
21.0	7.59	18.21	0.1	294.15	0.369642	9.287878	1.48%
21.0	7.66	18.24	0.1	294.15	0.370262	9.28795	1.74%
21.1	7.75	17.36	0.1	294.25	0.352081	9.285841	2.15%
21.1	7.72	17.18	0.1	294.25	0.348367	9.285411	2.01%

STUDY: 31244
 CLIENT: AECOM
 PROJECT: New Haven Harbor FNP - 2018
 ASSAY: *Leptocheirus plumulosus* 10 Day Solid Phase Evaluation

TASK: Pore Water Ammonia Summary
 METHOD: SM 4500-NH3 G

Sample ID	Day	ESI Code	Ammonia				Units	Sampled	Analyzed
			Total	Qual	Unionized	QLimit			
Laboratory Control	00	31244-107	0.69		0.0002	0.5	mg/L as N	11/09/18 1200	11/12/18 1100
CLDS Reference Site	00	31244-108	ND		0.0104	0.5	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 2	00	31244-109	15		0.2467	0.5	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 3	00	31244-110	6.5		0.1329	0.5	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 4	00	31244-111	6.9		0.1614	0.5	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 5	00	31244-112	16		0.2424	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Composite 6	00	31244-401	3.8		0.0987	0.1	mg/L as N	11/09/18 1200	11/12/18 1100
Laboratory Control	03	31244-207	1.8		0.0009	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
CLDS Reference Site	03	31244-208	0.28		0.0045	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 2	03	31244-209	7.2		0.0999	0.5	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 3	03	31244-210	2		0.0207	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 4	03	31244-211	3.2		0.0459	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 5	03	31244-212	6.7		0.0628	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Composite 6	03	31244-213	0.91		0.0188	0.1	mg/L as N	11/12/18 1000	11/12/18 1100
Laboratory Control	10	31244-307	1.2		0.0019	0.2	mg/L as N	11/19/18 1100	11/20/18 1100
CLDS Reference Site	10	31244-308	0.26		0.0025	0.2	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 2	10	31244-309	0.8		0.0053	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 3	10	31244-310	0.1		0.0007	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 4	10	31244-311	0.36		0.0028	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 5	10	31244-312	0.5		0.0016	0.1	mg/L as N	11/19/18 1100	11/20/18 1100
Composite 6	10	31244-313	0.2		0.0024	0.1	mg/L as N	11/19/18 1100	11/20/18 1100

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and U
 Consistent with USEPA AWQC (1989) and Whitfield (1974). Differs from Colt (2004) and F
 Where: I = Ionic Strength $(19.9273 \cdot N_{11}) / (1000 - 1.005109 \cdot N_{11})$
 pK_a = ionization constant of ammonium ion in aqueous saline solution $(+9.245 + F_{NH_3})$
 F_{NH_3} = fraction of UIA $(+1 / (1 + 10^{(R_{11} + 0.0324 \cdot (298 - P_{11}) + ((0.0415 \cdot 1) / P_{11}) - M_1))$
 Tot NH₃ = total ammonia, or QLimit if ND
 pressure in F_{NH3} assumed to be 1 atm

L	M	N	O	P	Q	R	S
temp (°C)	pH (SU)	salinity (ppt)	Tot NH ₃	Temp (°K)	I	pKa	F _{NH₃}
20.9	5.82	20	0.69	294.05	0.406722	9.29218	0.03%
21.0	7.75	22	0.5	294.15	0.448314	9.297004	2.08%
21.0	7.65	24	15	294.15	0.490077	9.301849	1.64%
21.2	7.73	20	6.5	294.35	0.406722	9.29218	2.04%
21.2	7.79	20	6.9	294.35	0.406722	9.29218	2.34%
21.2	7.60	21	16	294.35	0.427497	9.29459	1.51%
21.1	7.84	20	3.8	294.25	0.406722	9.29218	2.60%
21.2	6.10	19	1.8	294.35	0.38599	9.289775	0.05%
21.1	7.63	21	0.28	294.25	0.427497	9.29459	1.61%
21.0	7.57	22	7.2	294.15	0.448314	9.297004	1.39%
20.9	7.44	20	2	294.05	0.406722	9.29218	1.04%
21.0	7.58	20	3.2	294.15	0.406722	9.29218	1.43%
21.1	7.39	20	6.7	294.25	0.406722	9.29218	0.94%
21.1	7.74	21	0.91	294.25	0.427497	9.29459	2.06%
21.2	6.60	20	1.2	294.35	0.406722	9.29218	0.15%
21.0	7.41	21	0.26	294.15	0.427497	9.29459	0.97%
21.2	7.24	21	0.8	294.35	0.427497	9.29459	0.67%
21.3	7.26	21	0.1	294.45	0.427497	9.29459	0.70%
21.1	7.31	21	0.36	294.25	0.427497	9.29459	0.78%
21.1	6.93	20	0.5	294.25	0.406722	9.29218	0.33%
20.9	7.51	20	0.2	294.05	0.406722	9.29218	1.21%

DAY10 *Leptocheirus plumulosus* Sediment Assay Recovery

DATE: 11/19/18

STUDY: 31244

CLIENT: AECOM

PROJECT: New Haven Harbor

SAMPLE ID	REP	#LIVE ADULTS	INITIALS	SAMPLE ID	REP	#LIVE ADULTS	INITIALS
Laboratory Control	A	19	GRS	Composite 4	A	18	LAG
	B	20	GRS		B	19	LAG
	C	20	GRS		C	17	LAG
	D	19	GRS		D	19	LAG
	E	20	GRS		E	19	LAG
CLDS Reference Site <small>ES LAG 1119 Polyonete found in in Rep. D and E</small>	A	19	GRS	Composite 5	A	20	LAG
	B	20	GRS		B	20	LAG
	C	20	LAG		C	19	LAG
	D	3	LAG		D	20	LAG
	E	17	LAG		E	21	LAG
Composite 2	A	20	LAG	Composite 6	A	18	LAG
	B	18	LAG		B	19	LAG
	C	18	LAG		C	20	LAG
	D	18	LAG		D	18	LAG
	E	20	LAG		E	19	LAG
Composite 3	A	19	LAG				
	B	20	LAG				
	C	18	LAG				
	D	19	LAG				
	E	20	LAG				

CETIS Test Data Worksheet

Report Date: 20 Nov-18 10:57 (p 1 of 1)
Test Code/ID: 00-3053-0358/31244Lp

Leptocheirus 10-d Survival and Reburial Sediment Test			EnviroSystems, Inc.		
Start Date: 09 Nov-18 12:00	Species: Leptocheirus plumulosus	Sample Code: 31244-000			
End Date: 19 Nov-18 12:00	Protocol: EPA/600/R-94/025 (1994)	Sample Source: New Haven Harbor 2018			
Sample Date: 09 Nov-18	Material: Laboratory Control Sediment	Sample Station: Laboratory Control (Lp)			

Sample	Rep	Pos	# Exposed	# Survived	# Reburied	Notes
31244-000	1	4	20	19		
31244-000	2	9	20	20		
31244-000	3	19	20	20		
31244-000	4	25	20	19		
31244-000	5	33	20	20		
31242-008	1	3	20	19		
31242-008	2	13	20	20		
31242-008	3	16	20	20		
31242-008	4	28	20	3		
31242-008	5	29	20	17		
31243-101	1	5	20	20		
31243-101	2	14	20	18		
31243-101	3	15	20	18		
31243-101	4	26	20	18		
31243-101	5	32	20	20		
31243-102	1	2	20	19		
31243-102	2	10	20	20		
31243-102	3	18	20	18		
31243-102	4	23	20	19		
31243-102	5	30	20	20		
31243-103	1	7	20	18		
31243-103	2	8	20	19		
31243-103	3	20	20	17		
31243-103	4	22	20	19		
31243-103	5	31	20	19		
31243-104	1	1	20	20		
31243-104	2	12	20	20		
31243-104	3	21	20	19		
31243-104	4	24	20	20		
31243-104	5	34	21	21		
31243-105	1	6	20	18		
31243-105	2	11	20	19		
31243-105	3	17	20	20		
31243-105	4	27	20	18		
31243-105	5	35	20	19		

CETIS Summary Report

Report Date: 20 Nov-18 11:14 (p 1 of 2)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test **EnviroSystems, Inc.**

Batch ID: 11-4202-1754	Test Type: Survival-Reburial	Analyst: Nancy Roka
Start Date: 09 Nov-18 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Not Applicable
Ending Date: 19 Nov-18 12:00	Species: Leptocheirus plumulosus	Brine: Not Applicable
Duration: 10d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31244-000	08-7981-0638	09 Nov-18	09 Nov-18	12h	AECOM	Dredged Sediment Evalu
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h		
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	15d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	14d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	14d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	15d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	16d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31244-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Lp)	
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
09-9817-5480	Proportion Survived	Equal Variance t Two-Sample Test	0.2222	31242-008 passed proportion survived
21-1748-0076	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.2222	31242-008 passed proportion survived
15-4805-4366	Proportion Survived	Equal Variance t Two-Sample Test	0.7787	31243-101 passed proportion survived
21-0660-1885	Proportion Survived	Equal Variance t Two-Sample Test	0.3816	31243-101 passed proportion survived
06-3414-4958	Proportion Survived	Equal Variance t Two-Sample Test	0.5640	31243-102 passed proportion survived
01-8970-3237	Proportion Survived	Unequal Variance t Two-Sample Test	0.8147	31243-102 passed proportion survived
13-1444-9439	Proportion Survived	Equal Variance t Two-Sample Test	0.1882	31243-103 passed proportion survived
05-5330-0129	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.4405	31243-103 passed proportion survived
16-0232-5096	Proportion Survived	Equal Variance t Two-Sample Test	0.8654	31243-104 passed proportion survived
07-4359-7899	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-104 passed proportion survived
12-7809-4904	Proportion Survived	Equal Variance t Two-Sample Test	0.3507	31243-105 passed proportion survived
00-8519-4313	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5476	31243-105 passed proportion survived

Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31244-000	LC	5	0.980	0.946	1.000	0.950	1.000	0.012	0.027	2.79%	0.00%
31242-008	RS	5	0.790	0.339	1.000	0.150	1.000	0.162	0.363	45.95%	19.39%
31243-101		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	4.08%
31243-102		5	0.960	0.908	1.000	0.900	1.000	0.019	0.042	4.36%	2.04%
31243-103		5	0.920	0.864	0.976	0.850	0.950	0.020	0.045	4.86%	6.12%
31243-104		5	0.990	0.962	1.000	0.950	1.000	0.010	0.022	2.26%	-1.02%
31243-105		5	0.940	0.888	0.992	0.900	1.000	0.019	0.042	4.45%	4.08%

CETIS Summary Report

Report Date: 20 Nov-18 11:14 (p 2 of 2)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test						EnviroSystems, Inc.
Proportion Survived Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31244-000	LC	0.950	1.000	1.000	0.950	1.000
31242-008	RS	0.950	1.000	1.000	0.150	0.850
31243-101		1.000	0.900	0.900	0.900	1.000
31243-102		0.950	1.000	0.900	0.950	1.000
31243-103		0.900	0.950	0.850	0.950	0.950
31243-104		1.000	1.000	0.950	1.000	1.000
31243-105		0.900	0.950	1.000	0.900	0.950

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 1 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID:	21-1748-0076		Endpoint:	Proportion Survived			CETIS Version:	CETISv1.9.3			
Analyzed:	20 Nov-18 11:11		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31244-000	08-7981-0638	09 Nov-18	09 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31244-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Lp)								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Angular (Corrected)	C > T	31242-008 passed proportion survived					24.17%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Lab Control Sedime		Reference Sed	23	n/a	2	8	Exact	0.2222	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.56	2.29	0.0037	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.152089	0.152089	1	1.5	0.2550	Non-Significant Effect					
Error	0.809343	0.101168	8								
Total	0.961433		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	51.4	23.2	0.0022	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.761	0.741	0.0049	Non-Normal Distribution						
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31244-000	LC	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31242-008	RS	5	0.790	0.339	1.000	0.950	0.150	1.000	0.162	45.95%	19.39%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31244-000	LC	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31242-008	RS	5	1.17	0.614	1.72	1.35	0.398	1.46	0.199	38.18%	17.45%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31244-000	LC	0.950	1.000	1.000	0.950	1.000					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31244-000	LC	1.35	1.46	1.46	1.35	1.46					
31242-008	RS	1.35	1.46	1.46	0.398	1.17					

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 2 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 09-9817-5480		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:11		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31244-000	08-7981-0638	09 Nov-18	09 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31244-000	Laboratory Control Sediment	New Haven Harbor 2018		Laboratory Control (Lp)							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31242-008 passed proportion survived					6.00%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Lab Control Sedime		Reference Sed	0.81	1.89	0.127	7	CDF	0.2222	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0065749		0.0065749	1	0.657	0.4445	Non-Significant Effect				
Error	0.0701038		0.0100148	7							
Total	0.0766787			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.72	24.3	0.1682	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.701	0.2327	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31244-000	LC	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	3.06%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31244-000	LC	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	3.85%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31244-000	LC	0.950	1.000	1.000	0.950	1.000					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31244-000	LC	1.35	1.46	1.46	1.35	1.46					
31242-008	RS	1.35	1.46	1.46	1.17						

CETIS Analytical Report

Report Date: 20 Nov-18 11:47 (p 1 of 1)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 15-4805-4366		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	15d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-101 passed proportion survived					36.87%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.808	1.86	0.383	8	CDF	0.7787	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.51	2.29	0.0076	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0690657		0.0690657	1	0.653	0.4425	Non-Significant Effect				
Error	0.846667		0.105833	8							
Total	0.915732			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			15	23.2	0.0223	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.793	0.741	0.0118	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.790	0.339	1.000		0.150	1.000	0.162	45.95%	0.00%
31243-101		5	0.940	0.872	1.000		0.900	1.000	0.025	5.83%	-18.99%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.17	0.614	1.72		0.398	1.46	0.199	38.18%	0.00%
31243-101		5	1.33	1.19	1.48		1.25	1.46	0.0514	8.62%	-14.25%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
31243-101		1.000	0.900	0.900	0.900	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS										
31243-101											

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 3 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 21-0660-1885		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	15d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-101 passed proportion survived					8.45%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.313	1.89	0.157	7	CDF	0.3816	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0015072		0.0015072	1	0.0982	0.7631	Non-Significant Effect				
Error	0.107427		0.0153467	7							
Total	0.108934			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.38	24.3	0.7395	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.868	0.701	0.1170	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	0.00%
31243-101		5	0.940	0.872	1.000	0.900	0.900	1.000	0.025	5.83%	1.05%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	0.00%
31243-101		5	1.33	1.19	1.48	1.25	1.25	1.46	0.0514	8.62%	1.92%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
31243-101		1.000	0.900	0.900	0.900	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	1.17						
31243-101		1.46	1.25	1.25	1.25	1.46					

CETIS Analytical Report

Report Date: 20 Nov-18 11:47 (p 1 of 1)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 01-8970-3237		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-102 passed proportion survived					43.25%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.01	2.13	0.433	4	CDF	0.8147	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.54	2.29	0.0052	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.104762		0.104762	1	1.02	0.3431	Non-Significant Effect				
Error	0.825489		0.103186	8							
Total	0.930251			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			25.1	23.2	0.0086	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.787	0.741	0.0101	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.790	0.339	1.000		0.150	1.000	0.162	45.95%	0.00%
31243-102		5	0.960	0.908	1.000		0.900	1.000	0.019	4.36%	-21.52%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.17	0.614	1.72		0.398	1.46	0.199	38.18%	0.00%
31243-102		5	1.37	1.26	1.48		1.25	1.46	0.0397	6.48%	-17.55%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
31243-102		0.950	1.000	0.900	0.950	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS										
31243-102											

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 4 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 06-3414-4958		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform		Alt Hyp			Comparison Result				PMSD		
Angular (Corrected)		C > T			31243-102 passed proportion survived				7.31%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.167	1.89	0.141	7	CDF	0.5640	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0003445		0.0003445	1	0.028	0.8719	Non-Significant Effect				
Error	0.0862495		0.0123214	7							
Total	0.0865941			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.31	24.3	0.4369	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.867	0.701	0.1146	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	0.00%
31243-102		5	0.960	0.908	1.000	0.950	0.900	1.000	0.019	4.36%	-1.05%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	0.00%
31243-102		5	1.37	1.26	1.48	1.35	1.25	1.46	0.0397	6.48%	-0.92%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
31243-102		0.950	1.000	0.900	0.950	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	1.17						
31243-102		1.35	1.46	1.25	1.35	1.46					

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 5 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 05-5330-0129		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Angular (Corrected)	C > T		31243-103 passed proportion survived				36.06%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	26	n/a	2	8	Exact	0.4405	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.55	2.29	0.0045	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0389869	0.0389869	1	0.381	0.5542	Non-Significant Effect					
Error	0.818391	0.102299	8								
Total	0.857378		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			32.4	23.2	0.0053	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.776	0.741	0.0074	Non-Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.790	0.339	1.000	0.950	0.150	1.000	0.162	45.95%	0.00%
31243-103		5	0.920	0.864	0.976	0.950	0.850	0.950	0.020	4.86%	-16.46%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.17	0.614	1.72	1.35	0.398	1.46	0.199	38.18%	0.00%
31243-103		5	1.29	1.19	1.39	1.35	1.17	1.35	0.035	6.06%	-10.70%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
31243-103		0.900	0.950	0.850	0.950	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	0.398	1.17					
31243-103		1.25	1.35	1.17	1.35	1.35					

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 6 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 13-1444-9439		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	14d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Angular (Corrected)	C > T			31243-103 passed proportion survived				6.91%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0.945	1.89	0.135	7	CDF	0.1882	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0100878		0.0100878	1	0.892	0.3763	Non-Significant Effect				
Error	0.0791511		0.0113073	7							
Total	0.089239			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.97	24.3	0.3197	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.701	0.1704	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	0.00%
31243-103		5	0.920	0.864	0.976	0.950	0.850	0.950	0.020	4.86%	3.16%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	0.00%
31243-103		5	1.29	1.19	1.39	1.35	1.17	1.35	0.035	6.06%	4.96%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
31243-103		0.900	0.950	0.850	0.950	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	1.17						
31243-103		1.25	1.35	1.17	1.35	1.35					

CETIS Analytical Report

Report Date: 20 Nov-18 11:48 (p 1 of 1)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 07-4359-7899		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	15d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-104 passed proportion survived					35.64%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	33.5	n/a	3	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.57	2.29	0.0033	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.182097	0.182097	1	1.81	0.2153	Non-Significant Effect					
Error	0.804322	0.10054	8								
Total	0.986418		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			76.1	23.2	0.0010	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.741	0.741	0.0028	Non-Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.790	0.339	1.000		0.150	1.000	0.162	45.95%	0.00%
31243-104		5	0.990	0.962	1.000		0.950	1.000	0.010	2.26%	-25.32%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.17	0.614	1.72		0.398	1.46	0.199	38.18%	0.00%
31243-104		5	1.44	1.37	1.5		1.35	1.46	0.0228	3.55%	-23.13%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
31243-104		1.000	1.000	0.950	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS										
31243-104											

CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 7 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 16-0232-5096		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	15d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-104 passed proportion survived					6.07%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-1.2	1.89	0.123	7	CDF	0.8654	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0133925		0.0133925	1	1.44	0.2691	Non-Significant Effect				
Error	0.065082		0.0092974	7							
Total	0.0784746			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			6.99	24.3	0.0910	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.869	0.701	0.1190	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	0.00%
31243-104		5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	-4.21%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	0.00%
31243-104		5	1.44	1.37	1.5	1.46	1.35	1.46	0.0228	3.55%	-5.71%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
31243-104		1.000	1.000	0.950	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	1.17						
31243-104		1.46	1.46	1.35	1.46	1.46					

CETIS Analytical Report

Report Date: 20 Nov-18 11:48 (p 1 of 1)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 00-8519-4313		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	16d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Angular (Corrected)	C > T		31243-105 passed proportion survived				36.22%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28	n/a	3	8	Exact	0.5476	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.54	2.29	0.0050	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0662302	0.0662302	1	0.643	0.4458	Non-Significant Effect					
Error	0.824043	0.103005	8								
Total	0.890273		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			26.3	23.2	0.0078	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.78	0.741	0.0084	Non-Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.790	0.339	1.000		0.150	1.000	0.162	45.95%	0.00%
31243-105		5	0.940	0.888	0.992		0.900	1.000	0.019	4.45%	-18.99%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.17	0.614	1.72		0.398	1.46	0.199	38.18%	0.00%
31243-105		5	1.33	1.22	1.44		1.25	1.46	0.0388	6.53%	-13.95%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	0.150	0.850					
31243-105		0.900	0.950	1.000	0.900	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS										
31243-105											

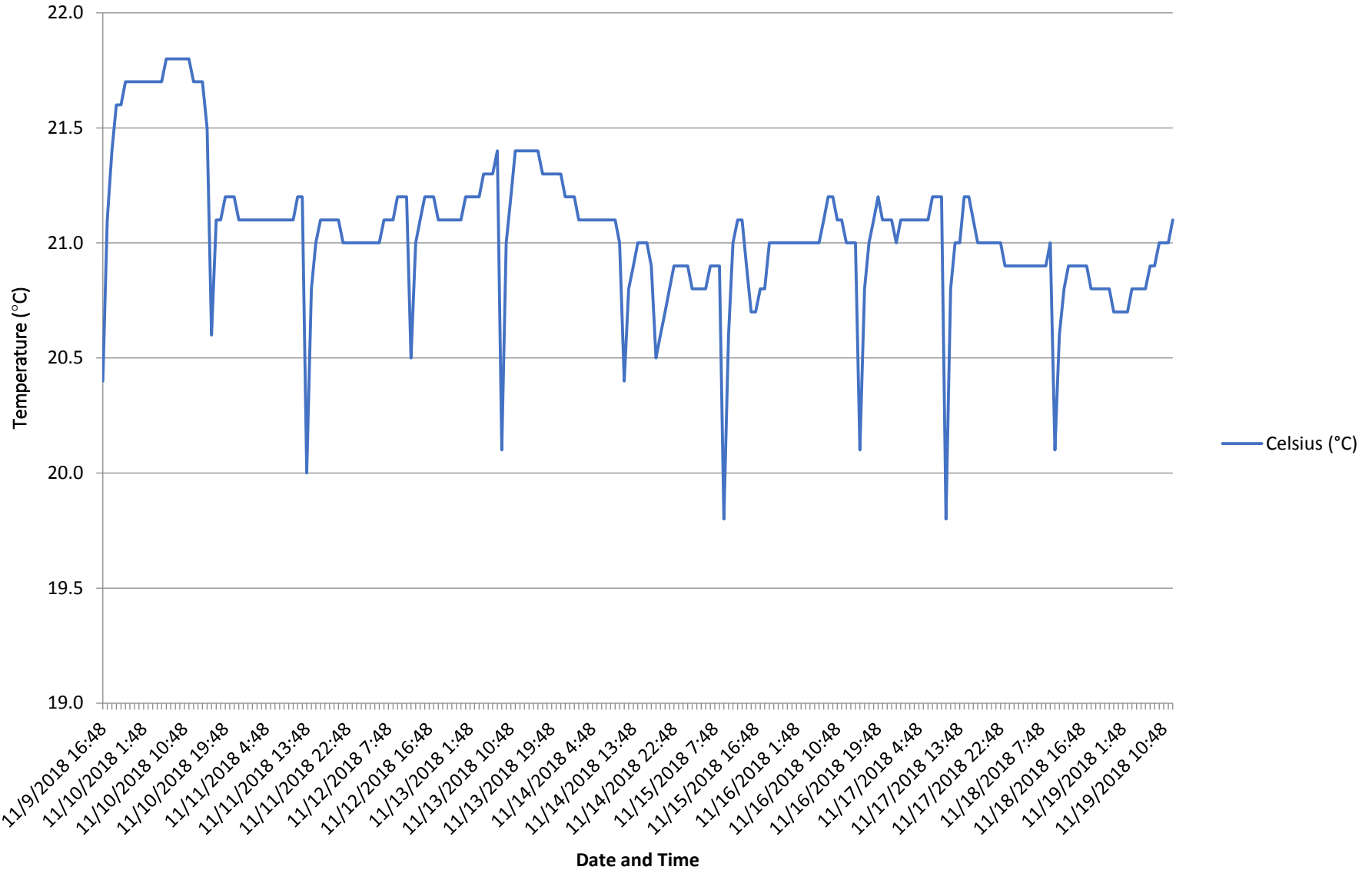
CETIS Analytical Report

Report Date: 20 Nov-18 11:14 (p 8 of 8)
Test Code: 31244Lp | 00-3053-0358

Leptocheirus 10-d Survival and Reburial Sediment Test							EnviroSystems, Inc.				
Analysis ID: 12-7809-4904		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 20 Nov-18 11:12		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	17d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	16d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-105 passed proportion survived					7.23%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.399	1.89	0.14	7	CDF	0.3507	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0019327		0.0019327	1	0.16	0.7015	Non-Significant Effect				
Error	0.0848035		0.0121148	7							
Total	0.0867362			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.42	24.3	0.4135	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.941	0.701	0.5918	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.950	0.837	1.000	0.975	0.850	1.000	0.035	7.44%	0.00%
31243-105		5	0.940	0.888	0.992	0.950	0.900	1.000	0.019	4.45%	1.05%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.36	1.14	1.57	1.4	1.17	1.46	0.0675	9.93%	0.00%
31243-105		5	1.33	1.22	1.44	1.35	1.25	1.46	0.0388	6.53%	2.17%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.950	1.000	1.000	Outlier	0.850					
31243-105		0.900	0.950	1.000	0.900	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.35	1.46	1.46	1.17						
31243-105		1.25	1.35	1.46	1.25	1.35					

31244 & 31245 - New Haven Harbor 2018

A. bahia & *L. plumulosus* 10 day Solid Phase Evaluation



STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
1	11/9/2018 16:48	20.4
2	11/9/2018 17:48	21.1
3	11/9/2018 18:48	21.4
4	11/9/2018 19:48	21.6
5	11/9/2018 20:48	21.6
6	11/9/2018 21:48	21.7
7	11/9/2018 22:48	21.7
8	11/9/2018 23:48	21.7
9	11/10/2018 0:48	21.7
10	11/10/2018 1:48	21.7
11	11/10/2018 2:48	21.7
12	11/10/2018 3:48	21.7
13	11/10/2018 4:48	21.7
14	11/10/2018 5:48	21.7
15	11/10/2018 6:48	21.8
16	11/10/2018 7:48	21.8
17	11/10/2018 8:48	21.8
18	11/10/2018 9:48	21.8
19	11/10/2018 10:48	21.8
20	11/10/2018 11:48	21.8
21	11/10/2018 12:48	21.7
22	11/10/2018 13:48	21.7
23	11/10/2018 14:48	21.7
24	11/10/2018 15:48	21.5
25	11/10/2018 16:48	20.6
26	11/10/2018 17:48	21.1
27	11/10/2018 18:48	21.1
28	11/10/2018 19:48	21.2
29	11/10/2018 20:48	21.2
30	11/10/2018 21:48	21.2
31	11/10/2018 22:48	21.1
32	11/10/2018 23:48	21.1
33	11/11/2018 0:48	21.1
34	11/11/2018 1:48	21.1
35	11/11/2018 2:48	21.1

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
36	11/11/2018 3:48	21.1
37	11/11/2018 4:48	21.1
38	11/11/2018 5:48	21.1
39	11/11/2018 6:48	21.1
40	11/11/2018 7:48	21.1
41	11/11/2018 8:48	21.1
42	11/11/2018 9:48	21.1
43	11/11/2018 10:48	21.1
44	11/11/2018 11:48	21.2
45	11/11/2018 12:48	21.2
46	11/11/2018 13:48	20.0
47	11/11/2018 14:48	20.8
48	11/11/2018 15:48	21.0
49	11/11/2018 16:48	21.1
50	11/11/2018 17:48	21.1
51	11/11/2018 18:48	21.1
52	11/11/2018 19:48	21.1
53	11/11/2018 20:48	21.1
54	11/11/2018 21:48	21.0
55	11/11/2018 22:48	21.0
56	11/11/2018 23:48	21.0
57	11/12/2018 0:48	21.0
58	11/12/2018 1:48	21.0
59	11/12/2018 2:48	21.0
60	11/12/2018 3:48	21.0
61	11/12/2018 4:48	21.0
62	11/12/2018 5:48	21.0
63	11/12/2018 6:48	21.1
64	11/12/2018 7:48	21.1
65	11/12/2018 8:48	21.1
66	11/12/2018 9:48	21.2
67	11/12/2018 10:48	21.2
68	11/12/2018 11:48	21.2
69	11/12/2018 12:48	20.5
70	11/12/2018 13:48	21.0

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
71	11/12/2018 14:48	21.1
72	11/12/2018 15:48	21.2
73	11/12/2018 16:48	21.2
74	11/12/2018 17:48	21.2
75	11/12/2018 18:48	21.1
76	11/12/2018 19:48	21.1
77	11/12/2018 20:48	21.1
78	11/12/2018 21:48	21.1
79	11/12/2018 22:48	21.1
80	11/12/2018 23:48	21.1
81	11/13/2018 0:48	21.2
82	11/13/2018 1:48	21.2
83	11/13/2018 2:48	21.2
84	11/13/2018 3:48	21.2
85	11/13/2018 4:48	21.3
86	11/13/2018 5:48	21.3
87	11/13/2018 6:48	21.3
88	11/13/2018 7:48	21.4
89	11/13/2018 8:48	20.1
90	11/13/2018 9:48	21.0
91	11/13/2018 10:48	21.2
92	11/13/2018 11:48	21.4
93	11/13/2018 12:48	21.4
94	11/13/2018 13:48	21.4
95	11/13/2018 14:48	21.4
96	11/13/2018 15:48	21.4
97	11/13/2018 16:48	21.4
98	11/13/2018 17:48	21.3
99	11/13/2018 18:48	21.3
100	11/13/2018 19:48	21.3
101	11/13/2018 20:48	21.3
102	11/13/2018 21:48	21.3
103	11/13/2018 22:48	21.2
104	11/13/2018 23:48	21.2
105	11/14/2018 0:48	21.2

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
106	11/14/2018 1:48	21.1
107	11/14/2018 2:48	21.1
108	11/14/2018 3:48	21.1
109	11/14/2018 4:48	21.1
110	11/14/2018 5:48	21.1
111	11/14/2018 6:48	21.1
112	11/14/2018 7:48	21.1
113	11/14/2018 8:48	21.1
114	11/14/2018 9:48	21.1
115	11/14/2018 10:48	21.0
116	11/14/2018 11:48	20.4
117	11/14/2018 12:48	20.8
118	11/14/2018 13:48	20.9
119	11/14/2018 14:48	21.0
120	11/14/2018 15:48	21.0
121	11/14/2018 16:48	21.0
122	11/14/2018 17:48	20.9
123	11/14/2018 18:48	20.5
124	11/14/2018 19:48	20.6
125	11/14/2018 20:48	20.7
126	11/14/2018 21:48	20.8
127	11/14/2018 22:48	20.9
128	11/14/2018 23:48	20.9
129	11/15/2018 0:48	20.9
130	11/15/2018 1:48	20.9
131	11/15/2018 2:48	20.8
132	11/15/2018 3:48	20.8
133	11/15/2018 4:48	20.8
134	11/15/2018 5:48	20.8
135	11/15/2018 6:48	20.9
136	11/15/2018 7:48	20.9
137	11/15/2018 8:48	20.9
138	11/15/2018 9:48	19.8
139	11/15/2018 10:48	20.6
140	11/15/2018 11:48	21.0

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
141	11/15/2018 12:48	21.1
142	11/15/2018 13:48	21.1
143	11/15/2018 14:48	20.9
144	11/15/2018 15:48	20.7
145	11/15/2018 16:48	20.7
146	11/15/2018 17:48	20.8
147	11/15/2018 18:48	20.8
148	11/15/2018 19:48	21.0
149	11/15/2018 20:48	21.0
150	11/15/2018 21:48	21.0
151	11/15/2018 22:48	21.0
152	11/15/2018 23:48	21.0
153	11/16/2018 0:48	21.0
154	11/16/2018 1:48	21.0
155	11/16/2018 2:48	21.0
156	11/16/2018 3:48	21.0
157	11/16/2018 4:48	21.0
158	11/16/2018 5:48	21.0
159	11/16/2018 6:48	21.0
160	11/16/2018 7:48	21.1
161	11/16/2018 8:48	21.2
162	11/16/2018 9:48	21.2
163	11/16/2018 10:48	21.1
164	11/16/2018 11:48	21.1
165	11/16/2018 12:48	21.0
166	11/16/2018 13:48	21.0
167	11/16/2018 14:48	21.0
168	11/16/2018 15:48	20.1
169	11/16/2018 16:48	20.8
170	11/16/2018 17:48	21.0
171	11/16/2018 18:48	21.1
172	11/16/2018 19:48	21.2
173	11/16/2018 20:48	21.1
174	11/16/2018 21:48	21.1
175	11/16/2018 22:48	21.1

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
176	11/16/2018 23:48	21.0
177	11/17/2018 0:48	21.1
178	11/17/2018 1:48	21.1
179	11/17/2018 2:48	21.1
180	11/17/2018 3:48	21.1
181	11/17/2018 4:48	21.1
182	11/17/2018 5:48	21.1
183	11/17/2018 6:48	21.1
184	11/17/2018 7:48	21.2
185	11/17/2018 8:48	21.2
186	11/17/2018 9:48	21.2
187	11/17/2018 10:48	19.8
188	11/17/2018 11:48	20.8
189	11/17/2018 12:48	21.0
190	11/17/2018 13:48	21.0
191	11/17/2018 14:48	21.2
192	11/17/2018 15:48	21.2
193	11/17/2018 16:48	21.1
194	11/17/2018 17:48	21.0
195	11/17/2018 18:48	21.0
196	11/17/2018 19:48	21.0
197	11/17/2018 20:48	21.0
198	11/17/2018 21:48	21.0
199	11/17/2018 22:48	21.0
200	11/17/2018 23:48	20.9
201	11/18/2018 0:48	20.9
202	11/18/2018 1:48	20.9
203	11/18/2018 2:48	20.9
204	11/18/2018 3:48	20.9
205	11/18/2018 4:48	20.9
206	11/18/2018 5:48	20.9
207	11/18/2018 6:48	20.9
208	11/18/2018 7:48	20.9
209	11/18/2018 8:48	20.9
210	11/18/2018 9:48	21.0

STUDY: 31244 & 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 Day Solid Phase Evaluation

TASK: Hourly Temperature Data

Serial Number: Telatemp 10015860

Mean: 21.0 °C
Minimum: 19.8 °C
Maximum: 21.8 °C

Reading	Date and Time	Celsius (°C)
211	11/18/2018 10:48	20.1
212	11/18/2018 11:48	20.6
213	11/18/2018 12:48	20.8
214	11/18/2018 13:48	20.9
215	11/18/2018 14:48	20.9
216	11/18/2018 15:48	20.9
217	11/18/2018 16:48	20.9
218	11/18/2018 17:48	20.9
219	11/18/2018 18:48	20.8
220	11/18/2018 19:48	20.8
221	11/18/2018 20:48	20.8
222	11/18/2018 21:48	20.8
223	11/18/2018 22:48	20.8
224	11/18/2018 23:48	20.7
225	11/19/2018 0:48	20.7
226	11/19/2018 1:48	20.7
227	11/19/2018 2:48	20.7
228	11/19/2018 3:48	20.8
229	11/19/2018 4:48	20.8
230	11/19/2018 5:48	20.8
231	11/19/2018 6:48	20.8
232	11/19/2018 7:48	20.9
233	11/19/2018 8:48	20.9
234	11/19/2018 9:48	21.0
235	11/19/2018 10:48	21.0
236	11/19/2018 11:48	21.0
237	11/19/2018 12:48	21.1
238	11/19/2018 13:48	21.0
239	11/19/2018 14:48	20.6
240	11/19/2018 15:48	20.6
241	11/19/2018 16:48	20.5

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	NA
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	NA
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	NA
15. Were the SRM/CRM analyses within acceptance criteria?	NA
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	NA
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	NA
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	NA
19. Were surrogate recoveries within the required acceptance criteria?	NA
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	Yes, except as noted for salinity and dissolved oxygen
22. Were the test-specific age requirements met for each test species?	Yes
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	Yes
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	Yes
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	Yes

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species	Yes, except as noted for salinity and dissolved oxygen	Salinity outside limits, dissolved oxygen below ESI's SOP limit but with RIM target limit (Section 3.3, Table 4, Appendix A)	Data Package
Test species age	Age/health within guidelines for each species (Appendix V)	Yes		Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No	Yes		Data Package (separate cover)
Water column toxicity test: Control mortality Control abnormality	≤ 10% mean ≤ 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae	NA		
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	≤ 10% mean (no chamber > 20%) See EPA (1994a) Section 9; Table 11.3	Yes		Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

ASSAY REVIEW CHECKLIST

STUDY#: 31244 / 31245

CLIENT: AECOM

PROJECT: New Haven Harbor FNP - 2018

ASSAY: *L. plumulosus* and *A. bahia* 10 day Solid Phase Evaluation

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	11/16/18	JTP	
Sample Receipt Complete	11/16/18	↓	
Organism Culture Sheet(s)	12/06/18		
Bench Sheets Complete (dates, times, initials, etc...)	12/06/18		
Water Quality Data Complete	11/27/18		
Weights Reported	N/A		
Assay Acceptability Review	11/19/18		↓

Technical Report Review	Date	Initials	Comments
Statistical Analysis	12/04/18	JTP (QC)	
Survival	11/20/18	NR	
Chemical	NA		
Statistical Analysis Reviewed	11/20/18	CJ	
Data Acceptability Review	11/20/18	NR	
Support Documentation			
Temperature Data Logger	12/12/18	NR	
Daily WQ Data	↓	↓	
Overlying and/or Pore Water Chemistry	↓	↓	
Other Chemical Analysis Data	NA		
Draft Report	12/12/18	NR	
Final Report Reviewed	12/13/18	BE/JTP	
QA Audit/Review Complete			
Final Report Printed - PDF	12/13/18	NR	
Report E-mailed / Faxed	12/13/18	NR	
Report Logged Out	↓	↓	

Appendix D.3: 28-Day Sediment Toxicity and Bioaccumulation Evaluation

Contract: W912WJ-17-D-0003
Delivery Order: W912WJ18F0109

**Supplemental Sampling and Testing in Support of the New Haven Harbor
Navigation Improvement Project, New Haven, Connecticut**

11 April, 2019

28-Day Bioassay and Tissue Analysis Report - Revised Submittal

**TOXICOLOGICAL EVALUATION
OF A PROPOSED DREDGE SEDIMENT:**

**New Haven Harbor Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut**

**New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109**

28 Day Bioaccumulation Evaluation

Prepared for:

AECOM
250 Apollo Drive
Chelmsford, Massachusetts 01824

Prepared by:

EnviroSystems, an affiliate of Enthalpy Analytical LLC
One Lafayette Road
Hampton, New Hampshire 03842

EnviroSystems, Inc. Master Reference 31242
Specific Studies 31249 & 31250

Report Issue Date: April 10, 2019
Assay Date: November 2018

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LABORATORY STANDARDS STATEMENT

This study was performed by EnviroSystems, an affiliate of Enthalpy Analytical LLC, at its facility in Hampton, New Hampshire. EnviroSystems' laboratory is accredited by the State of New Hampshire under the National Environmental Laboratory Accreditation (NELAC) program. Additionally, ESI is accredited under the Department of Defense (DoD) ELAP program, ISO/IEC 17025:2005, Certificate Number L2340. ESI also has an approved Laboratory Quality Assurance Plan (LQAP) covering all portions of this project. All testing conducted by EnviroSystems as part of this program was compliant with NELAC guidelines and standards. Additionally, this study was conducted in accordance with guidelines presented in the 2004 version of the New England District's Regional Implementation Manual (RIM) for Evaluation of Dredged Material Proposed for Disposal In New England Waters with additional direction provided by the CENAE in an email dated March 30, 2018. Any deviations from specific elements of the RIM are detailed in the Protocol Deviation section of this report.

For EnviroSystems



Kirk Cram
Laboratory Director

April 10, 2019

Date

TOXICOLOGICAL EVALUATION OF A PROPOSED DREDGE SEDIMENT:

New Haven Harbor 2018 Federal Navigation Project
Tier III Sediment Evaluation
New Haven, Connecticut

New England District Corps of Engineers
Contract No. W912WJ-17-D-0003 TO#5
Delivery Order No.: W912WJ18F0109

28 Day Bioaccumulation Evaluation

1.0 INTRODUCTION

As part of a comprehensive plan to reduce adverse environmental impacts of ocean dumping, Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 specifies that all sediments to be discharged into ocean waters must be evaluated to define their potential impact on existing benthic communities. The United States Environmental Protection Agency (US EPA) has determined that the most effective means to make such an assessment is through the use of bioassay tests that provide a relatively direct estimate of potential impact.

This project was designed to evaluate the potential toxicity of sediments from the area of dredging proposed for the New Haven Harbor 2018 Federal Navigation Project (FNP) located in New Haven, Connecticut. Placement of dredge materials is proposed at the Central Long Island Sound Disposal Site (CLDS).

Testing involved conduct of 28-day bioaccumulation evaluations using *Macoma nasuta* (bivalve clam) and *Nereis virens* (polychaete worm). Testing followed procedures established by the US EPA, US Army Corps of Engineers and the New England District Army Corps of Engineers (CENAE) for testing of dredged material. Procedures are presented in *Evaluation of Dredged Material Proposed for Ocean Disposal* (US EPA, US ACE 1991), *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual* (US EPA, US ACE 1998) and the *Regional Implementation Manual [RIM] for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (US EPA, CENAE, 2004), with additional direction provided by the CENAE in an email dated March 30, 2018 (Appendix A). All biological testing completed in support of the 28 day bioaccumulation evaluation were performed at EnviroSystems (ESI), an affiliate of Enthalpy Analytical LLC, Hampton, New Hampshire. All chemical analyses of surviving tissues were analyzed by Alpha Analytical Laboratory. Subsequent statistical analyses of the body burden data were completed by ESI.

2.0 METHODS AND MATERIALS

2.1 Sample Collection, Preservation and Storage

Sediment cores for toxicological analysis were collected by the US ACE New England District (CENAE) using vibracoring equipment from locations identified in the dredge footprint specified in the project Work Plan (AECOM, 2018). Sediment samples were received from AECOM, Chelmsford, Massachusetts under chain of custody in 3.5 gallon polyethylene buckets, and were composited based on the compositing scheme outlined in the Work Plan. Reference sediment samples were collected by the AECOM field team from the CLDS. Upon arrival at the laboratory, all samples received an internal sample control number and were logged into the project sample control system. Prior to testing, samples were placed in a secure refrigerator and stored at a temperature of $4 \pm 2^\circ\text{C}$ until test initiation. Sample identification, collection and receipt information is summarized in Table 1. Sample compositing information is provided in Table 2.

Sediment for the laboratory control treatment was collected from the Hampton-Seabrook Estuary, Hampton, New Hampshire. The area is not known to receive any direct industrial inputs and has been used as laboratory reference sediment in the testing of marine sediments for over 30 years. Overlying seawater is pumped in daily from the estuary and stored in holding tanks. Seawater is obtained through a filter system located on the bottom of the estuary at a point approximately 1 mile from the open ocean. Laboratory water is aerated through the collection system and in individual storage containers and test chambers. Water from the estuary has been used for the culture and maintenance of test organisms at ESI since 1978. The laboratory control was included to verify the health of the test organisms, and as a relative benchmark for reference site toxicity.

2.2 Test Organisms

M. nasuta were obtained from Aquatic Research Organisms (ARO), Hampton, New Hampshire. Organisms were field collected along the Washington coast and shipped to ARO via overnight delivery. At ESI, the clams were placed in clean holding sediment with flowing seawater and monitored for at least 24 hours prior to use. Damaged bivalves and those that would not close when prodded or did not burrow into sediment were not used for testing. Clams used for the assay were approximately 28-45 mm total length.

Adult *N. virens* were also obtained from ARO. Worms were collected in the field from the Damariscotta River in Boothbay Harbor, Maine and delivered to ARO. If not used the same day, worms were refrigerated overnight in seaweed. Damaged and inactive worms were not used in the assay.

2.3 Bioaccumulation Evaluation

The assays were started by placing approximately 6 L of sediment (control, reference or site sediment) into 10 gallon aquaria designed for flow-through testing. Overlying water was then added to each aquarium. The volume of the overlying water in these chambers was 20-30 L. Water flow was adjusted to provide approximately 6 volume additions of water/day to each aquarium. Flow into each aquarium was set so that incoming water mixed throughout the tank and did not stratify as a surface layer.

M. nasuta and *N. virens* were indiscriminately selected from the pool of organisms and randomly added to the aquaria. A total of 20 worms and 20 clams were added by groups of 10 to each of 5 replicates; species were tested in separate test chambers. Animals that did not burrow within the first 24 hours were removed and replaced with new test organisms. Temperature was maintained at 12-16°C with no readings exceeding $\pm 3^\circ\text{C}$. Salinity was maintained at $30 \pm 2\text{‰}$. The photoperiod was set at 16:8 hours light:dark. Dissolved oxygen levels were maintained at a minimum level of $\geq 60\%$ saturation by providing aeration to all tanks from the start of the assay. Organisms were not fed during the exposure period.

Dissolved oxygen, pH, temperature, specific conductance and salinity were measured daily in all aquaria using a YSI[®] multi-parameter probe that captures the data electronically following a pre-determined sample reading order. Data were downloaded using YSI Data Manager[®] software and formatted into tables.

After 28 days exposure, *M. nasuta* and *N. virens* were recovered from the test sediments and counted. Survival counts were used for statistical analysis. All living organisms were transferred to clean test vessels and maintained in clean seawater for 24 hours to allow for removal of sediment from the animals' digestive tracts. After the depuration period, organisms were transferred to 4 ounce glass jars and frozen. Tissues were subsequently processed (ground up and homogenized) and frozen for delivery to Alpha Analytical for chemical analysis of total metals, PAH, PCB congeners, pesticides and lipids analysis. Tissue chains of custody are provided in Appendix A.

2.4 Tissue Analysis

Methods used by Alpha Analytical in the analyses of tissues generated from the bioaccumulation tests followed protocols recommended in Table 8 of the New England District RIM document with

appropriate updates related to current methods. Tissues were prepared using USEPA Method 3051A for inorganics and USEPA 3570 for organics. Trace metals were evaluated using EPA Method 6020B, Inductively Coupled Plasma - Mass Spectrometry (ICP-MS), and mercury was evaluated using EPA Method 7474, Atomic Fluorescence Spectrometry. PAH compounds and PCB congeners were analyzed by EPA Method SW 846 8082/EPA 680 (modified), and pesticides were analyzed by SW 846 8081B. Reporting Limits and/or Method Detection Limits met RIM requirements with the exception of PCB congeners. The complete tissue chemistry and quality assurance analytical report is provided under separate cover by Alpha Analytical. Summaries of the tissue chemistry results used for the statistical analysis of body burden data are provided in Appendix A.

2.5 Data Analysis

The statistical analyses of survival and body burden data were completed at ESI using CETIS™ ver. 1.9.3.0 (Comprehensive Environmental Toxicity Information System) software to determine significant differences between the reference tissue and the site composite tissues. Data were evaluated to determine homogeneity of sample variances and normality of distribution using appropriate statistics. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Statistical difference was evaluated at $\alpha = 0.05$. Per RIM guidelines and direction provided by the CENAE in an email dated March 30, 2018 (Appendix A), one-half the MDL is used in instances when a compound of concern (COC) is not detected for purposes of calculating a mean tissue concentration and total concentrations for PAHs, PCBs, and pesticides. MDLs used in statistical computations may differ due to differences in tissue mass and final extract volumes used in the analysis for each sample.

All mean body burden concentrations presented in the narrative report tables, CETIS™ reports and the CENAE EDD spreadsheet for each composite are calculated from the same source of tissue chemistry data generated by Alpha Analytical and provided by AECOM on January 30, 2019. Reported concentrations are presented to a precision of 2 significant figures (3 significant figures for metals ≥ 10.0 $\mu\text{g/g}$). Slight differences in the mean concentrations are attributable to the ability and limitations of each software package to capture significant figures. The values agree within reason by rounding and represent the magnitude of the average concentration of the COC detected in tissue.

Following CENAE protocol, the statistical analyses were completed for all COCs identified in the Sampling and Analysis Plan and are included in Appendix A, however the findings of significance presented in the report focus only on those COCs detected in the reference sample.

2.6 Reference Toxicant Evaluation

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Summaries of acute exposure reference toxicant assays conducted in support of this study are provided in Table 3.

3.0 RESULTS

Table 4 provides a summary of laboratory control performance and test acceptability criteria. Tables 5 and 6 provide a summary of *M. nasuta* and *N. virens* survival data and statistical analyses, respectively. Tables 7 and 8 provide summaries of body burden data for *M. nasuta* and *N. virens*, respectively. Table 9 provides a supplemental statistical evaluation of PCB congeners in *N. virens* native tissue, and Table 10 summarizes the findings of significant uptake in clam and worm tissue as compared with the CLDS. The number of significant figures for mean concentrations presented in Tables 7 and 8 and those used in the statistical analysis may also vary. Laboratory bench sheets, detailed summaries of survival, body burden data and associated support data are included in Appendix A.

3.1 *Macoma nasuta*

3.1.1 Survival

Mean *M. nasuta* survival in both the laboratory control and CLDS reference samples was 99% with a coefficient of variation (CV) of 2%. Surviving organisms from the control, reference and site composite samples provided sufficient tissue for preparation and analysis of body burdens. The endpoints met and/or exceeded requirements specified in the current version of the RIM.

After 28 days exposure, mean survival of bivalves in the site composite samples ranged from 94% (Composite 5) to 100% (Composite 2). The statistical evaluation of the data showed no significant reductions in survival for bivalves maintained in any of the site composite samples when compared to the CLDS reference sediment.

3.1.2 Water Quality Summary

Daily water quality data collected during the assay documented a mean temperature of 11.6°C with a range of 11.0 to 12.4°C. The target test temperature for the assay was 14±2°C with acceptable limits of 11 to 17°C. Temperature data were also collected on an hourly basis starting on day 9 (11/30/18). The mean hourly temperature value was 12.0°C and ranged from 11.8°C to 12.5°C during the course of the assay. Additional daily water quality data documented salinity levels during the assay varied from 25.7 to 32.0‰ with a mean value of 29.5‰. Dissolved oxygen levels ranged from 58% to 106% with a mean level of 98% while pH ranged from 7.14 to 8.00 SU. Review of the data documented that the salinity fell outside limits specified by ESI's protocol, the New England District's RIM and/or the Inland Testing Manual. See Section 3.3 for a discussion of the deviation and missing hourly temperature data.

3.1.3 Body Burden Analysis

Based on CENAE criteria, there were significant increases in body burdens for clams maintained in the project composite sediments for two metals (cadmium and lead), 6 PAHs and 4,4'-DDE as compared to CLDS reference tissue. Most notably, the PAHs primarily in composites 2, 3, 4 and 6 tissues were detected at concentrations 5 to 16 times higher than in CLDS reference tissue, especially fluoranthene in composites 3, 4 and 6, and chrysene and pyrene in composite 6 tissue, which were also detected at concentrations an order of magnitude or more greater than in reference tissue.

Review of the native clam tissue data indicates that the site composite concentration of cadmium, lead and 4,4'-DDE were only slightly higher than in native tissue, suggesting that a certain percentage of the findings of significance may be attributable to levels occurring in pre-test clam tissue. The same is true for 5 of the 6 PAHs detected in composite 5 tissue. Test organisms were obtained from suppliers routinely used and are indigenous, therefore there is an inherent level of uncertainty and variability in concentrations of COCs present in individual organisms used in respective test treatments.

Review of body burden data also showed that the following COCs were detected in clam tissue following exposure to site composite sediment but were not detected in CLDS reference tissue, therefore these COCs were eliminated from further evaluation: 6 PAHs (acenaphthene, anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene), 10 PCB congeners (8, 18, 28, 44, 52, 66, 101, 118, 138 and 153), and 6 pesticides (4,4'-DDD, 4,4'-DDT, alpha-chlordane, gamma-chlordane, dieldrin and oxychlordane).

3.2 *Nereis virens*

3.2.1 Survival

Mean *N. virens* survival in the laboratory control sediment was 96% with a coefficient of variation (CV) of 4%. Mean survival in the CLDS reference sediment was 98% with a CV of 3%. Surviving

organisms from the control, reference and site composite samples provided sufficient tissue for preparation and analysis of body burdens. The endpoints met and/or exceeded requirements specified in the current version of the RIM.

After 28 days exposure, mean survival of polychaetes in the site composite samples ranged from 93% (Composite 5) to 97% (Composites 3 and 4). The statistical evaluation of the data showed a significant reduction in survival for polychaetes maintained in composite 5 sediment when compared to the CLDS reference sediment, however the difference in survival was <10%.

3.2.2 Water Quality Summary

Daily water quality data collected during the assay documented a mean temperature of 11.4°C with a range of 10.8 to 12.2°C. The target test temperature for the assay was 14±2°C with acceptable limits of 11 to 17°C. Temperature data were also collected on an hourly basis starting on day 10 (11/30/18). The mean hourly temperature value was 12.0°C and ranged from 11.8°C to 12.5°C during the course of the assay. Additional daily water quality data documented salinity levels during the assay varied from 13.3 to 32.1‰ with a mean value of 29.5‰. Dissolved oxygen levels ranged from 41% to 105% with a mean level of 96% while pH ranged from 7.32 to 8.02 SU. Review of the data documented that the temperature and salinity fell outside limits specified by ESI's protocol, the New England District's RIM and/or the Inland Testing Manual. See Section 3.3 for a discussion of the deviation and missing hourly temperature data.

3.2.3 Body Burden Analysis

Based on CENAE criteria, there were significant increases in body burdens for worms maintained in the project composite sediments for only 1 metal (copper) and 5 PCB congeners (138, 153, 170, 180 and 187) as compared to CLDS reference tissue.

Review of the native worm tissue data indicates that the site tissue concentration of PCB congeners 138 and 170 were approximately equal to or less than concentrations found in native tissue, and site tissue concentrations of copper and PCB congeners 153, 180 and 187 were only slightly higher than in native tissue, indicating that the findings of significance may be attributable to levels present in pre-test worm tissue. Test organisms were obtained from suppliers routinely used and are indigenous, therefore there is an inherent level of uncertainty and variability in concentrations of COCs present in individual organisms used in respective test treatments.

Following this finding, a supplemental statistical evaluation of PCBs in native worm tissue was completed to identify where the concentrations in native tissue were either significantly *greater than* CLDS reference or composite tissue, and also where concentrations in native worm tissues were significantly *less than* CLDS reference or composite tissue. The findings of this evaluation are presented in Table 9 and Appendix A. There were no instances where PCB concentrations in CLDS reference tissues were significantly higher than native tissue, and only 2 instances for PCB 52 where the composite tissue was significantly higher than native tissue (composites 2 and 4). In the latter scenario, PCB 52 was not detected in CLDS reference tissue, therefore was not evaluated further. Conversely, certain PCBs (e.g., PCBs 138, 153, 170, 180 and 187) in composites 2, 4 and 5 worm tissue that were significantly higher as compared with CLDS reference sediment were also significantly higher in native tissue as compared with the CLDS reference tissue, which is further evidence of the similarity among composites 2, 4 and 5 tissue and native tissue concentrations of PCBs. It was also noted that the concentrations of these congeners in composite tissue were not significantly greater than in native tissue.

Review of body burden data also showed that the following COCs were detected in worm tissue following exposure to site composite sediment but were not detected in CLDS reference tissue, therefore these COCs were eliminated from further evaluation: mercury, 2 PAHs (fluoranthene and pyrene), 7 PCB congeners (8, 18, 52, 101, 105, 128 and 195), and 14 pesticides (4,4'-DDE, 4,4'-DDT, aldrin, cis-nonachlor, alpha-chlordane, gamma-chlordane, dieldrin endosulfan I, endosulfan II, gamma-BHC, heptachlor, heptachlor epoxide, hexachlorobenzene and oxychlordane).

3.3 Protocol Deviations

Review of the assay data revealed the following deviations from the method and/or ESI's protocol:

Data from daily temperature readings suggests that temperatures were generally on the low end of the acceptable range as the mean temperature of 11.4°C for the *N. virens* assay falls below the targeted limit of 14±2°C and the mean temperature of 11.6°C for the *M. nasuta* assay only meets the criterion by rounding to the precision reflected in the protocol. The mean temperature of 12.0°C calculated from the hourly data logger readings is within the acceptable range. Although slightly low, the daily temperature values are still within the normal temperature range tolerated by these species. It is the opinion of ESI's technical manager that this deviation had no adverse impact on the results of the assays.

Data from the daily salinity readings indicates that the minimum measurements fell outside of the acceptable range for both species. The excursions all occurred on November 28, 2018 (day 7 of the *M. nasuta* assay and day 8 of the *N. virens* assay) and were all within the 25-27‰ range, except for one measurement of 13.3‰ in replicate E of composite 5 for *N. virens* that is likely an erroneous reading resulting from technician error. While the exact reason for the excursions is unclear, it is the opinion of ESI technical manager that these deviations had no adverse impact on the outcome of the assay.

The temperature logger for collecting hourly data was not activated at the start of the assays, but instead was activated on November 30, 2018 (day 9 of the *M. nasuta* assay and day 10 of the *N. virens* assay). As a result, approximately one-quarter of the hourly temperature readings were not recorded. In addition, daily water quality readings are missing for replicate A of composite 6 on day 0 of the *N. virens* assay due to a multi-probe malfunction, however water quality readings were obtained from replicates B, C, D and E for that same composite, and all measurements appear to be within reasonable proximity to each other and to the measurements collected for the other composites that day. While these deviations represent a data gap, it is the opinion of ESI's technical manager that this deviation did not adversely affect the outcome of the assay.

3.4 Summary

This program utilized protocols developed by the US EPA and the CENAE to assess the potential impact that the proposed dredge material collected from New Haven Harbor 2018 FNP would have on the marine environment. Results of the 28 day toxicity evaluation indicate that the composite 5 sediment demonstrated significant negative effects on *N. virens* (worm) survival as compared with the CLDS reference site, however the difference in survival was <10%. There were no significant effects on worm survival for any of the other composites, or for *M. nasuta* when compared against the CLDS reference sediment.

Results of body burden data generated from both *M. nasuta* and *N. virens* tissue showed that exposure to the site composite sediment samples resulted in significant uptake of several COCs when compared to organisms maintained in the CLDS reference sediment. Significant uptake was demonstrated for cadmium, lead, 6 PAHs and 4,4'-DDE by *M. nasuta* and for copper and 5 PCB congeners by *N. virens*. Most notable were PAHs that were detected in clam tissues at levels 5 to 16 times higher than in reference tissue, primarily from composites 2 (R',S'), 3 (US 1-2), 4 (DS 1-2) and 6 (CAD 1-3). The concentrations of the metals, PCBs and 4,4'-DDE in site tissues were only slightly higher than in reference tissue and, in the case of PCBs in composites 2, 4 and 5 worm tissue, were found to be similar to levels in native worm tissue.

4.0 REFERENCES

AECOM. 2018. *Supplemental Sampling and Testing in Support of the New Haven Harbor Navigation Improvement Project: Project Work Plan, New Haven, Connecticut [Work Plan]*. Chelmsford, Massachusetts. October 2018.

US EPA, US ACE. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual. EPA-503/8-91/001. 204 pages.

US EPA, US ACE. 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the US - Testing Manual. Appendix E. EPA-823-B-98-004, February 1998.

US EPA Region I, Corps of Engineers, New England District. 2004. Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters. September 2004.

Table 1. Sample Collection and Receipt Information. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Field ID	ESI Code	Sample Type	Matrix	Collection		Receipt	
				Date	Time	Date	Time
Comp V',W' Station V'	31242-001	Site	Solid	10/23/18	1125	10/24/18	1015
Comp V',W' Station W'	31242-002	Site	Solid	10/23/18	1125	10/24/18	1015
Comp R',S' Station R'	31242-003	Site	Solid	10/23/18	1215	10/24/18	1015
Comp R',S' Station S'	31242-004	Site	Solid	10/23/18	1215	10/24/18	1015
Comp CAD 1-3 Station CAD-1	31242-005	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD-2	31242-006	Site	Solid	10/23/18	1527	10/24/18	1015
Comp CAD 1-3 Station CAD-3	31242-007	Site	Solid	10/23/18	1527	10/24/18	1015
NHH-CLDS	31242-008	Reference	Solid	10/23/18	1028	10/24/18	1015
Comp TB 1-2, Station TB-1	31242-010	Site	Solid	10/24/18	1146	10/25/18	0835
Comp TB 1-2, Station TB-2	31242-011	Site	Solid	10/24/18	1146	10/25/18	0835
Comp DS 1-2, Station DS-1	31242-012	Site	Solid	10/24/18	1006	10/25/18	0835
Comp DS 1-2, Station DS-2	31242-013	Site	Solid	10/24/18	1006	10/25/18	0835
Comp US 1-2, Station US-1	31242-019	Site	Solid	10/25/18	1023	10/25/18	1820
Comp US 1-2, Station US-2	31242-020	Site	Solid	10/25/18	1023	10/25/18	1820
Comp DS 1-2, Station DS-2	31242-023	Site	Solid	10/25/18	0946	10/25/18	1820

Notes:

^a The Station IDs listed include detailed information written on individual sample buckets.

Table 2. Summary of Sample Compositing. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Composite ID	ESI Code	Components		Final Amount	Composite	
		Station ID	ESI Code		Date	Time
Composite 1 ^a	31243-100	Comp V',W' Station V'	31242-001	~7 gal	10/24/18	1100
		Comp V',W' Station W'	31242-002			
Composite 2	31243-101	Comp R',S' Station R'	31242-003	~28 gal	10/24/18	1545
		Comp R',S' Station S'	31242-004			
Composite 3	31243-102	Comp US 1-2, Station US-1	31242-019	~28 gal	10/25/18	2030
		Comp US 1-2, Station US-2	31242-020			
Composite 4	31243-103	Comp DS 1-2, Station DS-1	31242-012	~28 gal	10/25/18	2000
		Comp DS 1-2, Station DS-2	31242-013			
		Comp DS 1-2, Station DS-2	31242-023			
Composite 5	31243-104	Comp TB 1-2, Station TB-1	31242-010	~28 gal	10/25/18	1110
		Comp TB 1-2, Station TB-2	31242-011			
Composite 6	31243-105	Comp CAD 1-3 Station CAD-1	31242-005	~31 gal	10/24/18	1115
		Comp CAD 1-3 Station CAD-2	31242-006			
		Comp CAD 1-3 Station CAD-3	31242-007			

Note:

^a This sample was not included in the 28 day bioaccumulation evaluation.

Table 3. Summary of Reference Toxicant Data. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Date	Organism Lot	Value	Historic Mean	Acceptable Range	Reference Toxicant
<i>Macoma nasuta</i>					
11/21/18	99MnARO111318 LC-50	4.1	8.9	0.5 - 17.4	Copper (mg/L)
<i>Nereis virens</i>					
11/20/18	99NvARO112018 LC-50	1.3	3.1	0.5 - 5.7	Copper (mg/L)

Note: Means and Acceptable Ranges based on the past 20 reference toxicant assays. Acceptable range is defined as ± 2 standard deviations of historic mean.

Table 4. Summary of Laboratory Control Performance and Assay Acceptability Criteria. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Endpoint / Measurement	Protocol Criteria	Unit	<i>M. nasuta</i>	<i>N. virens</i>
Mean Survival	laboratory Control $\geq 90\%$	%	99%	96%
		Protocol Met	Yes	Yes
Tissue Mass	Sufficient for analysis	Protocol Met	Yes	Yes
Salinity	Minimum: 28‰	ppt	25.7	13.3
		Protocol Met	No ^a	No ^a
	Maximum: 32‰	ppt	32.0	32.1 ^b
		Protocol Met	Yes	Yes
Temperature	Mean: 14 \pm 2°C (target)	Daily / Hourly	11.6 ^b / 12.0	11.4 ^a / 12.0
	Minimum: 11°C	Daily / Hourly	11.0 / 11.8	10.8 ^b / 11.8
	Maximum: 17°C	Daily / Hourly	12.4 / 12.5	12.2 / 12.5
		Protocol Met	Yes / Yes	No ^a / Yes

Notes:

^a See Section 3.3 for a discussion of the protocol deviation.

^b The value meets the criterion by rounding to the precision reflected in the protocol.

Table 5. *M. nasuta* Survival Summary and Statistical Analysis. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Survival Summary						
Sample ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	31249-000	5	99%	95%	100%	2%
CLDS Reference Site	31242-008	5	99%	95%	100%	2%
Composite 2	31243-101	5	100%	100%	100%	0%
Composite 3	31243-102	5	98%	90%	100%	5%
Composite 4	31243-103	5	96%	90%	100%	4%
Composite 5	31243-104	5	94%	90%	100%	6%
Composite 6	31243-105	5	98%	90%	100%	5%

Survival Statistical Analysis						
Sample ID	ESI Code	Mean	Significantly "<" as Compared to: CLDS (31242-008)	Difference in Survival >10% as Compared to: CLDS (31242-008)		
CLDS Reference Site	31242-008	99%	-	-	-	-
Composite 2	31243-101	100%	No/No	No	-1%	
Composite 3	31243-102	98%	No/No	No	1%	
Composite 4	31243-103	96%	No	No	3%	
Composite 5	31243-104	94%	No	No	5%	
Composite 6	31243-105	98%	No/No	No	1%	

Notes:

No/No indicates that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 6. *N. virens* Survival Summary and Statistical Analysis. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Survival Summary						
Sample ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	31250-000	5	96%	90%	100%	4%
CLDS Reference Site	31242-008	5	98%	95%	100%	3%
Composite 2	31243-101	5	96%	85%	100%	7%
Composite 3	31243-102	5	97%	95%	100%	3%
Composite 4	31243-103	5	97%	95%	100%	3%
Composite 5	31243-104	5	93%	90%	95%	3%
Composite 6	31243-105	5	94%	85%	100%	7%

Survival Statistical Analysis						
Sample ID	ESI Code	Mean	Significantly "<" as Compared to: CLDS (31242-008)	Difference in Survival >10% as Compared to: CLDS (31242-008)		
CLDS Reference Site	31242-008	98%	-	-	-	-
Composite 2	31243-101	96%	No	No	2%	
Composite 3	31243-102	97%	No	No	1%	
Composite 4	31243-103	97%	No	No	1%	
Composite 5	31243-104	93%	Yes	No	5%	
Composite 6	31243-105	94%	No	No	4%	

Table 7. Statistical Comparisons of *M. nasuta* Body Burdens vs. CLDS Reference Site. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Trace Metals															
Arsenic, total	mg/kg	1.8		2.3		1.9NS		2.3NS		1.8NS		1.8NS		1.7NS	
Cadmium, total	mg/kg	0.029b		0.024b		0.030bS		0.027bNS		0.025bNS		0.026bNS		0.028bNS	
Chromium, total	mg/kg	0.46		0.49b		0.47NS		0.38bNS		0.46NS		0.32bNS		0.49NS	
Copper, total	mg/kg	1.6		1.9		2.1NS		2.1NS		2.2NS		1.5NS		2.2NS	
Lead, total	mg/kg	0.28		0.46		0.45NS		0.40NS		0.40NS		0.31NS		0.61S	
Mercury, total	mg/kg	0.0037b		0.0064b		0.0031abNS		0.0018abNS		0.0023abNS		0.0020abNS		0.0074bNS	
Nickel, total	mg/kg	0.38		0.42		0.34NS		0.36NS		0.33NS		0.32NS		0.35NS	
Zinc, total	mg/kg	9.7		9.4		9.8NS		10.7NS		9.1NS		8.8NS		9.6NS	
PAH Compounds															
Acenaphthene	µg/kg	2.4a		2.3a		2.3ac		2.7abc		2.3ac		2.3ac		2.4ac	
Acenaphthylene	µg/kg	2.4a		2.3a		2.3ac		2.2ac		2.3ac		2.3ac		2.4ac	
Anthracene	µg/kg	2.4a		2.3a		3.7abc		7.4bc		6.6bc		2.3ac		4.4abc	
Benzo(a)anthracene	µg/kg	2.4a		3.6ab		18S		24S		23S		7.5bS		28S	
Benzo(a)pyrene	µg/kg	2.4a		2.3a		7.7bc		8.9bc		9.6bc		2.7abc		17c	
Benzo(b)fluoranthene	µg/kg	2.4a		2.8ab		16S		17S		17S		7.8bS		23S	
Benzo(k)fluoranthene	µg/kg	2.4a		2.3a		8.2bc		11bc		11bc		4.4abc		17c	
Benzo(g,h,i)perylene	µg/kg	2.4a		2.3a		2.3ac		3.8abc		4.2abc		2.3ac		7.6bc	
Chrysene	µg/kg	2.4a		2.8ab		17S		23S		24S		7.6bS		30S	
Dibenz(a,h)anthracene	µg/kg	2.4a		2.3a		2.3ac		2.2ac		2.3ac		2.3ac		2.4ac	
Fluoranthene	µg/kg	3.5ab		6.3ab		55S		98S		83S		29S		78S	
Fluorene	µg/kg	2.4a		2.3a		2.3ac		2.2ac		2.3ac		2.3ac		2.4ac	
Indeno(1,2,3-c,d)pyrene	µg/kg	2.4a		2.3a		2.3ac		2.7abc		2.8abc		2.3ac		5.0abc	
Naphthalene	µg/kg	2.4a		2.3a		2.3ac		2.2ac		2.3ac		2.3ac		2.4ac	
Phenanthrene	µg/kg	2.4a		4.2ab		12S		16S		22S		6.9bS		11bS	
Pyrene	µg/kg	3.3ab		9.1b		45S		72S		64S		23S		113S	

New Haven Harbor FNP Tier III Sediment Evaluation. 28 Day Bioaccumulation Evaluation.
US ACE New England District. ESI Studies 31249 & 31250. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Total PAHs	µg/kg	40		52		200		297		278		107		345	
PCB Congeners															
PCB 008	µg/kg	0.24a		0.23a		0.40ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 018	µg/kg	0.47ab		0.23a		0.90ac		1.8 c		1.5 c		0.62 ac		0.52 ac	
PCB 028	µg/kg	0.24a		0.23a		2.2abc		0.61 abc		0.80 bc		0.23 ac		0.24 ac	
PCB 044	µg/kg	0.24a		0.23a		0.40abc		0.35 abc		0.60 abc		0.23 ac		0.24 ac	
PCB 052	µg/kg	0.24a		0.23a		1.2c		1.4 c		1.8 c		0.23 ac		0.24 ac	
PCB 066	µg/kg	0.24a		0.23a		0.63bc		0.56 bc		0.90 bc		0.23 ac		0.24 ac	
PCB 101	µg/kg	0.24a		0.23a		1.2c		0.83 bc		1.4 c		0.38 abc		0.30 abc	
PCB 105	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 118	µg/kg	0.24a		0.23a		0.61bc		0.42 abc		0.90 bc		0.28 abc		0.29 abc	
PCB 128	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 138	µg/kg	0.24a		0.23a		0.82bc		0.72 bc		1.2 bc		0.33 abc		0.31 abc	
PCB 153	µg/kg	0.24a		0.23a		0.79bc		0.69 bc		1.0 bc		0.32 abc		0.28 abc	
PCB 170	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 180	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.30 abc		0.23 ac		0.24 ac	
PCB 187	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 195	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 206	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
PCB 209	µg/kg	0.24a		0.23a		0.23ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
Total PCBs	µg/kg	9.0		8.3		22		19		24		10		10	
Pesticides															
Aldrin	µg/kg	0.24 a		0.23 a		0.23 ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
cis-Chlordane	µg/kg	0.24 a		0.23 a		0.23 ac		0.22 ac		0.23 ac		0.30 ac		0.24 ac	
trans-Chlordane	µg/kg	0.24 a		0.23 a		0.23 ac		2.1 c		1.5 c		1.0 ac		0.24 ac	
cis-Nonachlor	µg/kg	0.24 a		0.23 a		0.23 ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	
trans-Nonachlor	µg/kg	0.24 a		0.23 a		0.23 ac		0.22 ac		0.23 ac		0.23 ac		0.24 ac	

New Haven Harbor FNP Tier III Sediment Evaluation. 28 Day Bioaccumulation Evaluation.
US ACE New England District. ESI Studies 31249 & 31250. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Oxychlorane	µg/kg	0.47	a	0.46	a	0.62	ac	0.56	ac	0.45	ac	0.46	ac	0.47	ac
Total Chlordanes	µg/kg	1.4		1.4		1.5		3.3		2.6		2.2		1.4	
4,4'-DDT	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.29	ac	0.24	ac
4,4'-DDD	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.28	ac	0.23	ac	0.24	ac
4,4'-DDE	µg/kg	0.24	a	0.33	a	0.73	S	0.70	S	0.91	S	0.35	aNS	0.24	aNS
Total DDT	µg/kg	0.71		0.79		1.2		1.1		1.4		0.87		0.71	
Dieldrin	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.28	ac	0.23	ac	0.24	ac
alpha-Endosulfan	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.23	ac	0.24	ac
beta-Endosulfan	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.23	ac	0.24	ac
Endosulfans	µg/kg	0.47		0.46		0.46		0.44		0.45		0.46		0.47	
Endrin	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.23	ac	0.24	ac
Heptachlor	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.23	ac	0.24	ac
Heptachlor epoxide	µg/kg	0.47	a	0.46	a	0.46	ac	0.44	ac	0.45	ac	0.46	ac	0.47	ac
Hexachlorobenzene	µg/kg	0.47	a	0.46	a	0.46	ac	0.44	ac	0.45	ac	0.46	ac	0.47	ac
Lindane	µg/kg	0.24	a	0.23	a	0.23	ac	0.22	ac	0.23	ac	0.23	ac	0.24	ac
Methoxychlor	µg/kg	0.95	a	0.93	a	0.92	ac	0.89	ac	0.91	ac	0.91	ac	0.94	ac
Toxaphene	µg/kg	12	a	12	a	12	ac	11	ac	11	ac	11	ac	12	ac

Notes:

a = Analyte not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = Analyte estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = Analyte was detected in the treatment tissue sample replicates at an equal or higher mean concentration than in the associated reference site tissue, however statistical analysis is not required as the analyte was not detected in any of the reference site replicates.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$.

S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$.

Table 8. Statistical Comparisons of *N. virens* Body Burdens vs. CLDS Reference Site. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Trace Metals															
Arsenic, total	mg/kg	2.1		1.5		1.3NS		1.5 NS		1.4 NS		1.4 NS		1.5 NS	
Cadmium, total	mg/kg	0.030b		0.029b		0.028bNS		0.029 bNS		0.028bNS		0.022bNS		0.024bNS	
Chromium, total	mg/kg	0.29b		0.073b		0.061bNS		0.071 bNS		0.063bNS		0.077bNS		0.079bNS	
Copper, total	mg/kg	1.1		1.2		0.92NS		1.1 NS		1.1 NS		1.1 NS		1.4 S	
Lead, total	mg/kg	0.26		0.17		0.17NS		0.19 NS		0.17NS		0.13NS		0.15 NS	
Mercury, total	mg/kg	0.0021ab		0.0016a		0.0016ac		0.0048 abc		0.0047 abc		0.0072bc		0.0090bc	
Nickel, total	mg/kg	0.30		0.12		0.10bNS		0.11 NS		0.13 NS		0.12bNS		0.15 NS	
Zinc, total	mg/kg	7.7		10.4		10.1NS		6.7 NS		10.7NS		13.6NS		14.1 NS	
PAH Compounds															
Acenaphthene	µg/kg	4.9a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Acenaphthylene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Anthracene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Benzo(a)anthracene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Benzo(a)pyrene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Benzo(b)fluoranthene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Benzo(k)fluoranthene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Benzo(g,h,i)perylene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Chrysene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Dibenz(a,h)anthracene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Fluoranthene	µg/kg	3.4ab		2.3a		4.4abc		6.9 abc		6.9 abc		2.4 ac		6.0 bc	
Fluorene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Indeno(1,2,3-c,d)pyrene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Naphthalene	µg/kg	2.3a		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Phenanthrene	µg/kg	3.4ab		2.3a		2.3ac		2.3 ac		2.2 ac		2.4 ac		2.3 ac	
Pyrene	µg/kg	3.2ab		2.3a		2.9abc		4.7 abc		5.1 abc		2.4 ac		8.3 bc	

New Haven Harbor FNP Tier III Sediment Evaluation. 28 Day Bioaccumulation Evaluation.
 US ACE New England District. ESI Studies 31249 & 31250. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Total PAHs	µg/kg	43		37		39		44		44		38		47	
PCB Congeners															
PCB 008	µg/kg	0.72a		0.23 a		0.23ac		0.23 ac		0.52 ac		0.24 ac		0.23 ac	
PCB 018	µg/kg	1.9a		0.23 a		0.39ac		0.23 ac		1.1 ac		0.24 ac		0.88 ac	
PCB 028	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 044	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 052	µg/kg	0.35ab		0.23 a		0.63bc		0.31 abc		0.98 bc		0.24 ac		0.23 ac	
PCB 066	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 101	µg/kg	0.42ab		0.23 a		0.36abc		0.46 abc		0.78 abc		0.32 abc		0.23 ac	
PCB 105	µg/kg	0.23a		0.23 a		0.28abc		0.31 abc		0.22 ac		0.24 ac		0.23 ac	
PCB 118	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 128	µg/kg	0.23a		0.23 a		0.28abc		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 138	µg/kg	2.3		1.1 b		1.9S		1.8 NS		2.6 S		1.5 bNS		1.1 bNS	
PCB 153	µg/kg	3.1		1.7		3.1NS		3.0 NS		3.8 S		2.5 NS		1.9 NS	
PCB 170	µg/kg	1.2b		0.40 ab		1.1 abNS		0.94 abNS		1.1 aNS		0.91 abS		0.23 aNS	
PCB 180	µg/kg	3.0		1.4 b		3.1 S		2.8 NS		3.3 NS		2.2 bNS		1.2 bNS	
PCB 187	µg/kg	2.3		1.0 b		1.9 bNS		1.9 NS		2.4 S		1.4 abNS		0.85 abNS	
PCB 195	µg/kg	0.23a		0.23 a		0.23ac		0.33 abc		0.22 ac		0.24 ac		0.23 ac	
PCB 206	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 209	µg/kg	0.23a		0.23 a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
Total PCBs	µg/kg	35		17		30		28		37		23		18	
Pesticides															
Aldrin	µg/kg	0.23 a		0.23 a		0.23 ac		0.23 ac		0.28 ac		0.24 ac		0.23 ac	
cis-Chlordane	µg/kg	0.23 a		0.23 a		0.23 ac		0.23 ac		0.49 ac		0.24 ac		0.23 ac	
trans-Chlordane	µg/kg	0.23 a		0.23 a		0.23 ac		0.29 ac		0.40 ac		0.24 ac		0.23 ac	
cis-Nonachlor	µg/kg	0.23 a		0.23 a		0.23 ac		0.23 ac		0.48 ac		0.24 ac		0.23 ac	
trans-Nonachlor	µg/kg	0.23 a		0.23 a		0.23 ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	

New Haven Harbor FNP Tier III Sediment Evaluation. 28 Day Bioaccumulation Evaluation.
US ACE New England District. ESI Studies 31249 & 31250. November 2018.

Compound	Units	Native Tissue		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
Oxychlorane	µg/kg	0.47	a	0.46	a	0.46	ac	0.47	ac	0.45	ac	0.48	ac	0.47	ac
Total Chlordanes	µg/kg	1.4		1.4		1.4		1.5		2.0		1.4		1.4	
4,4'-DDT	µg/kg	0.23	a	0.23	a	0.43	ac	0.23	ac	0.63	ac	0.24	ac	0.23	ac
4,4'-DDD	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.22	ac	0.24	ac	0.23	ac
4,4'-DDE	µg/kg	0.23	a	0.23	a	0.23	ac	0.28	ac	0.22	ac	0.24	ac	0.23	ac
Total DDT	µg/kg	0.70		0.69		0.89		0.75		1.1		0.71		0.70	
Dieldrin	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.66	ac	0.24	ac	0.23	ac
alpha-Endosulfan	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.50	ac	0.24	ac	0.23	ac
beta-Endosulfan	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.45	ac	0.24	ac	0.23	ac
Endosulfans	µg/kg	0.47		0.46		0.46		0.47		0.94		0.48		0.47	
Endrin	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.22	ac	0.24	ac	0.23	ac
Heptachlor	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.31	ac	0.24	ac	0.23	ac
Heptachlor epoxide	µg/kg	0.47	a	0.46	a	0.46	ac	0.47	ac	0.45	ac	0.48	ac	0.47	ac
Hexachlorobenzene	µg/kg	0.47	a	0.46	a	0.46	ac	0.47	ac	1.3	ac	0.48	ac	0.47	ac
Lindane	µg/kg	0.23	a	0.23	a	0.23	ac	0.23	ac	0.67	ac	0.24	ac	0.23	ac
Methoxychlor	µg/kg	0.94	a	0.92	a	0.91	ac	0.94	ac	0.90	ac	0.95	ac	0.93	ac
Toxaphene	µg/kg	12	a	12	a	11	ac	12	ac	11	ac	12	ac	12	ac

Notes:

a = Analyte not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = Analyte estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = Analyte was detected in the treatment tissue sample replicates at an equal or higher mean concentration than in the associated reference site tissue, however statistical analysis is not required as the analyte was not detected in any of the reference site replicates.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$.

S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at $\alpha=0.05$

Table 9. Statistical Evaluation of PCB Congeners in *N. virens* Native (Pre-Test) Tissue. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

Compound	Units	Native Tissue ^d		CLDS Reference		Comp 2 (R',S')		Comp 3 (US 1-2)		Comp 4 (DS 1-2)		Comp 5 (TB 1-2)		Comp 6 (CAD 1-3)	
		Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual	Mean	Qual
PCB Congeners															
PCB 008	µg/kg	0.72a		0.23a		0.23ac		0.23 ac		0.52 ac		0.24 ac		0.23 ac	
PCB 018	µg/kg	1.9a		0.23a		0.39ac		0.23 ac		1.1 ac		0.24 ac		0.88 ac	
PCB 028	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 044	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 052	µg/kg	0.35ab		0.23a		0.63bc		0.31 abc		0.98 bc		0.24 ac		0.23 ac	
PCB 066	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 101	µg/kg	0.42 ab		0.23a		0.36abc		0.46 abc		0.78 abc		0.32 abc		0.23 ac	
PCB 105	µg/kg	0.23 a		0.23a		0.28abc		0.31 abc		0.22 ac		0.24 ac		0.23 ac	
PCB 118	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 128	µg/kg	0.23 a		0.23a		0.28abc		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 138	µg/kg	2.3		1.1 b		1.9		1.8		2.6		1.5 b		1.1 b	
PCB 153	µg/kg	3.1		1.7		3.1		3.0		3.8		2.5		1.9	
PCB 170	µg/kg	1.2 b		0.40 ab		1.1 ab		0.94 ab		1.1 a		0.91 ab		0.23 a	
PCB 180	µg/kg	3.0		1.4 b		3.1		2.8		3.3		2.2 b		1.2 b	
PCB 187	µg/kg	2.3		1.0 b		1.9b		1.9		2.4		1.4 ab		0.85 ab	
PCB 195	µg/kg	0.23 a		0.23a		0.23ac		0.33 abc		0.22 ac		0.24 ac		0.23 ac	
PCB 206	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
PCB 209	µg/kg	0.23 a		0.23a		0.23ac		0.23 ac		0.22 ac		0.24 ac		0.23 ac	
Total PCBs	µg/kg	35		17		30		28		37		23		18	

Notes:

a = Analyte not detected in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = Analyte estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = Statistical analysis is not required as the analyte was not detected in any of the reference site replicates.

^d Native tissue represents the mean of three replicates, whereas the CLDS and site composites represent a mean of 5 replicates.

Mean composite tissue body burden was significantly greater than the mean CLDS tissue body burden ($\alpha=0.05$) (C<T).

Mean composite tissue body burden was significantly greater than the mean native tissue body burden ($\alpha=0.05$) (C<T).

Mean **native tissue** body burden was significantly greater than the mean CLDS (C<T) or composite tissue (C>T) body burdens ($\alpha=0.05$).

Table 10. Summary of Significant Uptake in Tissue. 28 Day Bioaccumulation Evaluation. New Haven Harbor FNP. New Haven, Connecticut. November 2018.

	<i>Macoma nasuta</i>						<i>Nereis virens</i>				
	Composite	2	3	4	5	6	2	3	4	5	6
Metals (ug/g wet weight)											
Cadmium		S									
Copper											S
Lead						S					
PAHs (ng/g wet weight)											
Benzo(a)anthracene		S	S	S	S	S					
Benzo(b)fluoranthene		S	S	S	S	S					
Chrysene		S	S	S	S	S					
Fluoranthene		S	S	S	S	S					
Phenanthrene		S	S	S	S	S					
Pyrene		S	S	S	S	S					
PCBs (ng/g wet wt.)											
PCB 138							S		S		
PCB 153									S		
PCB 170										S	
PCB 180							S				
PCB 187									S		
Pesticides (ng/g wet weight)											
4,4'-DDE		S	S	S							

Note: "S" Indicates a finding of significance.

" " Indicates there was not a finding of significance.

Green shading indicates concentration in native tissue is greater than concentration in composite tissue.

Orange shading indicates concentration in composite tissue is 5 to 10 times higher than in CLDS reference tissue.

Red shading indicates concentration in composite tissue is ≥10 times higher than in CLDS reference tissue.

APPENDIX A:
RAW DATA & STATISTICAL SUPPORT

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Support Documents	
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STUDY NUMBER RECORD

Issue and complete this form for studies that will require multiple tasks and directly associated support studies. Issue consecutive study numbers at the start of the project to cover all potential elements of the project.

CLIENT: AECOM

CONTACT(S): Kris Van Naerssen

PROJECT: New Haven Harbor 2018

APP. NUMBER:

	Species / Analysis Parameters:	STUDY:
Sample Receipt:		31242
Rinseate Sample Analysis:	Reference Site Analyzed x 3	
Grain Size Analysis:		
Composite Prep/NH3 Mit:		31243
Bulk Sediment Analysis:		
10 Day Assay:	<i>Leptocheirus plumulosus</i>	31244
	<i>Americamysis bahia</i>	31245
Elutriate Preparation:	Type:	31246
Elutriate Analysis:	Pentachlorophenol	Yes / No
	Trace Metals	Yes / No
	PCB Congeners	Yes / No
	Pesticides	Yes / No
SPP Assays/NH3 Mit:	<i>Menidia beryllina</i>	
	<i>Americamysis bahia</i>	31248 / 31291
	<i>Arbacia punctulata</i>	
Bioaccumulation Study:	<i>Macoma nasuta</i>	31249
	<i>Nereis virens</i>	31250
Tissue Analysis:	Trace Metals	Yes / No
	PAH Compounds	Yes / No
	PCB Congeners	Yes / No
	Pesticides	Yes / No

Tissue analysis completed by Alpha Analytical

Chain of Custody Records

Sample Receipt Forms

CHAIN OF CUSTODY RECORD

31292

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	EUTRIATE TESTING	SOS RELATED PHASE TEST	10-DAY WHOLE SED. TEST	28-DAY BIOACCUM. TEST	REMARKS
		NEW HAVEN HARBOR									
SAMPLERS: (Signature)											
RICHARD LOYD <i>Richard B. Loyd</i>											
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/23	11:25	/		COMP U'W'	2	/	/			STATIONS U'W'
2	10/23	12:15	/		COMP R'S'	8	/	/	/		STATIONS R'S'
3	10/23	15:27	/		COMP CAD 1-3	9	/	/	/		STATIONS CAD-1, CAD-2, CAD-3
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
<i>Richard B. Loyd</i>		10/23/1800	<i>Chris My</i>			<i>Chris My</i>		10/23/18 1015	<i>Robert D. Allen</i>		
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)		Date/Time	Received by: (Signature)		
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS				

Distribution: Original Accompanies Shipment Copy 1 to Sample Custodian Copy 2 to Coordinator Field Files

Client/Project Name: USACE / AECOM

Project Location: New Haven Harbor / Central / CI Disposal Site

Analysis Requested

Project Number: 60588790

Field Logbook No.: 1

Sampler (Print Name)/(Affiliation): K. VAN NARSSON / AECOM

Chain of Custody Tape Nos.: N/A

Signature: [Signature]

Send Results/Report to: K. van Narsson

TAT: AS FOR WORK PLAN

- Container Type
- P - Plastic
 - A - Amber Glass
 - G - Clear Glass
 - V - VOA Vial
 - O - Other
 - E - Encore
- Preservation
- 1 - HCl, 4"
 - 2 - H2SO4, 4"
 - 3 - HNO3, 4"
 - 4 - NaOH, 4"
 - 5 - NaOH/ZnAc, 4"
 - 6 - Na2S2O3, 4"
 - 7 - 4"

- Matrix Codes:
- DW - Drinking Water
 - WW - Wastewater
 - GW - Groundwater
 - SW - Surface Water
 - ST - Storm Water
 - W - Water
 - S - Soil
 - SL - Sludge
 - SD - Sediment
 - SO - Solid
 - A - Air
 - L - Liquid
 - P - Product

Field Sample No./Identification	Date	Time	COMP	GRAB	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	Analysis Requested				Lab I.D.	Remarks
<u>NHH-CLDS</u>	<u>10/23/18</u>	<u>10:28</u>	<u>X</u>	<u>X</u>	<u>3.5 G (6)</u>	<u>SD</u>	<u>7</u>	<u>NO</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		<u>FOR WORK PLAN</u>
<u>NHH-CLDS</u>	<u>10/23/18</u>	<u>13:12</u>	<u>X</u>	<u>X</u>	<u>5 G (10)</u>	<u>SW</u>	<u>7</u>	<u>NO</u>	<u>X</u>	<u>X</u>				<u>PLAN / RIN</u>
<u>[Large diagonal signature across the table]</u>														

Relinquished by: (Print Name)/(Affiliation) K. van Narsson / AECOM

Date: 10/23/18
Time: 17:15

Received by: (Print Name)/(Affiliation) Charles Nixon
Signature: [Signature]

Date: 10/23
Time: 1715

Analytical Laboratory (Destination):

Relinquished by: (Print Name)/(Affiliation) Charles Nixon AECOM

Date: 10/24
Time: 1015

Received by: (Print Name)/(Affiliation) [Signature]

Date: 10/24/18
Time: 1015

Relinquished by: (Print Name)/(Affiliation)

Date:
Time:

Received by: (Print Name)/(Affiliation)

Date:
Time:

Sample Shipped Via: UPS FedEx Courier Other

Temp blank: Yes No

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/24/18 1015 Date and Time Logged into Lab: 10/31/18 1630
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 5 Custody Seals intact? NA
 Number of COC Pages: 2
 COC Serial Number(s): 02668
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp V',W' Station V'	31242-001	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp V',W' Station W'	31242-002	S	Elutriate Prep, SPP Assay	1x3.5gal	4 C	Yes
Comp R',S' Station R'	31242-003	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp R',S' Station S'	31242-004	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 1	31242-005	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 2	31242-006	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
Comp CAD 1-3 Station CAD 3	31242-007	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes
NHH-CLDS	31242-008	S	10-Day Solid Phase, 28-Day Bioaccumulation	6x3.5gal	4 C	Yes
NHH-CLDS	31242-009	W	SPP Assay, 10-Day Solid Phase, 28-Day Bioaccumulation	10x3.5gal	4 C	Yes

Notes and qualifications:

See COC

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	ELUTRATE PREP	SUSPENDED PHASE TOX	10 DAY WHOLES SED TOX	28 DAY BIOACCUM	REMARKS
NEW HAVEN HARBOR		SAMPLERS: (Signature) RICHARD LOYD <i>[Signature]</i>									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION						
1	10/24		/		COMP TB 1-2	8	/	/	/	SED FROM STATIONS TB-1 & TB-2	
2	10/24		/		COMP DS 1-2	5	/	/	/	SED FROM STATIONS DS-1 & DS-2	
3					COMP US 1-2	8	/	/		WATER FROM NEW HAVEN HBR	
4					COMP DS 1-2	8	/	/			
5					COMP TB 1-2	6	/	/			
6					COMP CAD 1,2,3	6	/	/			
7					COMP U'W'	6	/	/			
8					COMP R'S'	8	/	/			
Relinquished by: (Signature) <i>[Signature]</i>		Date/Time 10/24/15 4:45	Received by: (Signature) Charles Nixon 10/24/15 2:26			Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 10/25/15	Received by: (Signature) <i>[Signature]</i>			
Relinquished by: (Signature)		Date/Time	Received by: (Signature)			Relinquished by: (Signature)	Date/Time	Received by: (Signature)			
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)			Date/Time	REMARKS CAD 1,2,3 7 containers received DS 1-2 6 containers received				

Distribution: Original Accompanies Shipment Copy to 1 to Sample Custodian Copy 2 to Coordinator Field Files

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME					NO. OF CONTAINERS	GLUCONATE PRES	SUSPENDED PARTICLES	10-DAY WHOLE-CELL TEST	28-DAY BIOMASS	REMARKS
SAMPLERS: (Signature)		NEW HAVEN HARBOR										
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION							
0111	1	10/24	11:46	/	COMP TB 1-2	8	/	/	/	/	SED FROM STATIONS TB-1 & TB-2	
1143	2	10/24	10:06	/	COMP DS 1-2	5	/	/	/	/	SED FROM STATIONS DS-1 & DS-2	
0114	3	10/24	11:30		COMP US 1-2	8	/	/			WATER FROM NEW HAVEN HBR	
0115	4	10/24	11:45		COMP DS 1-2	8	/	/				
0116	5	10/24	12:00		COMP TB 1-2	6	/	/				
0117	6	10/24	12:15		COMP CAD 1,2,3	6	/	/				
4117	7	10/24	12:30		COMP U'W'	6	/	/				
6117	8	10/24	12:45		COMP R'S'	8	/	/				
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time	Relinquished by: (Signature)		Date/Time	Received by: (Signature)			
<i>Richard Lord</i>		10/24/1545	<i>Charles M. von</i>		10/24/1525	<i>Richard Lord</i>		10/25/1545	<i>Dr. J. White</i>			
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time	Relinquished by: (Signature)		Date/Time	Received by: (Signature)			
Relinquished by: (Signature)		Date/Time	Received for Laboratory by: (Signature)		Date/Time	REMARKS						
						CAD 1,2,3 7 containers received DS 1-2 6 containers received						

Distribution: Original Accompanies Shipment Copy to 1 to Sample Custodian Copy 2 to Coordinator Field Files

Richard B. Lord
 Digitally signed by
 LOVING, RICHARD B. 1274695142
 DN: c=US, ou=U.S. Government,
 ou=DoD, ou=FAO, ou=USA,
 cn=LOVING, RICHARD B. 1274695142
 Date: 2018.11.01 11:03:22 -0400

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 0835 Date and Time Logged into Lab: 11/27/18 1240
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp TB-1-2, Station TB-1	31242-010	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp TB-1-2, Station TB-2	31242-011	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-1	31242-012	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-013	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	1x3.5gal	4 C	Yes
Comp US 1-2	31242-014	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp DS 1-2	31242-015	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes
Comp TB 1-2	31242-016	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp CAD 1,2,3	31242-017	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp V',W'	31242-018	W	Elutriate Prep, SPP Assay	6x5gal	4 C	Yes
Comp R',S'	31242-022	W	Elutriate Prep, SPP Assay	8x5gal	4 C	Yes

Notes and qualifications:

See COC



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab:

ALPHA Job #:

Project Information

Project Name: **NEW HAVEN HARBOR**

Project Location: **NEW HAVEN, CT**

Project #:

Project Manager: **RICHARD LOYD**

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

ADEX EMAIL

Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program Criteria

Client Information

Client: **US ARMY CORPS OF ENG.**

Address: **696 VIRGINIA RD
CONCORD, MA 01742**

Phone: **978-318-8048**

Email: **RICHARD.B.LOYD@USACE.ARMY.MIL**

Additional Project Information:

ANALYSIS

VOC SVOC METALS METALS-ERCHAS EPH-CHANGES & TARGETS MPH-ERANGES & TARGETS PCB TPH-Quant Only PFAS

ELUTRATE PREP

SPP TOX.

10-DAY WHOLE SED TOX

28-DAY BIOACCUM

TOTAL # BOTTLES

SAMPLE INFO

Filtration

Field Lab to do

Preservation

Lab to do

Sample Comments

work 11/27
9/2/22
11/8/20

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	Sample Comments
		Date	Time			
	COMP DS 1-2	10/25	9:46	SE	RBL	STATION DS-23
	COMP US 1-2	10/25	10:23	SE	RBL	STATIONS US1928

- Container Type**
- P= Plastic
 - A= Amber glass
 - V= Vial
 - G= Glass
 - B= Bacteria cup
 - C= Cube
 - O= Other
 - E= Encore
 - D= BOD Bottle
- Preservative**
- A= None
 - B= HCl
 - C= HNO₃
 - D= H₂SO₄
 - E= NaOH
 - F= MeOH
 - G= NaHSO₄
 - H= Na₂S₂O₈
 - I= Ascorbic Acid
 - J= NH₄Cl
 - K= Zn Acetate
 - O= Other

Container Type	P P P P
Preservative	A A A A

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Richard B. Loyd</i>	10/25 13:30	<i>John Murphy</i>	10/25 1350
<i>John Murphy</i>	10/25 1820	<i>John Murphy</i>	10/25/18 1820

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: Client
 Date and Time Received: 10/25/18 1820 Date and Time Logged into Lab: 11/27/18 1245
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Comp US-1-2, Station US-1	31242-019	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp US-1-2, Station US-2	31242-020	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	4x3.5gal	4 C	Yes
Comp DS-1-2, Station DS-2	31242-023	S	Elutriate Prep, SPP Assay, 10-Day Solid Phase, 28-Day B	3x3.5gal	4 C	Yes

Notes and qualifications:

See COC



EnviroSystems, Inc.
 1 Lafayette Road
 P.O. Box 778
 Hampton, N.H. 03843

Voice: 603-926-3345
 FAX: 603-926-3521

ESI Job No:

31242

CHAIN OF CUSTODY DOCUMENTATION

Client: USACE MAE	Contact: Ben Lydi	Project Name: New Haven	Page _____ of _____
Report to:	Address:	Project Number:	
Invoice to:	Address:	Project Manager:	
Voice:	Fax:	email: Richard.B.Lydi@USACE.army.mil	P.O. No: _____ Quote No: _____

Protocol:		RCRA	SDWA	NPDES	USCOE	Other						
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested Special Instructions:	
010 021	NEW HAVEN	11/14	2:15	RBL	G	5gal Containers	P	4°C	W	N	(7 containers) SPP/Eutriate Prep	

Relinquished By: Sarah Turner	Date: 11/14/18	Time: 3:45	Received By: R. Swit	Date: 11/14/18	Time: 15:45
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments:

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO: 31242
 SDG No:
 Project: New Haven
 Delivered via: ESI
 Date and Time Received: 11/14/18 1545 Date and Time Logged into Lab: 11/27/18 1250
 Received By: BG Logged into Lab by: BG
 Air bill / Way bill: No Air bill included in folder if received? NA
 Cooler on ice/packs: Yes Custody Seals present? NA
 Cooler Blank Temp (C) at arrival: 4 Custody Seals intact? NA
 Number of COC Pages: 1
 COC Serial Number(s): NA
 COC Complete: Yes Does the info on the COC match the samples? Yes
 Sampled Date: Yes Were samples received within holding time? Yes
 Field ID complete: Yes Were all samples properly labeled? Yes
 Sampled Time: Yes Were proper sample containers used? Yes
 Analysis request: Yes Were samples received intact? (none broken or leaking) Yes
 COC Signed and dated: Yes Were sample volumes sufficient for requested analysis? Yes
 Were all samples received? Yes Were VOC vials free of headspace? NA
 Client notification/authorization: Not required pH Test strip ID number: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
New Haven	31242-021	W	Elutriate Prep, SPP Assay	7x5gal	4 C	Yes

Notes and qualifications:

See COC

Composite Preparation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 1
 Composite Lab ID.: 31243-100 Composite Final Volume: ≈ 7 gal
 Composite Matrix: Solid Composite Container(s): 2 x 3.5 gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1100
 Initials: CFS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
V	31242-001	S	Na	1 Shell	≈ 3.5 gal	
W	31242-002	S	Na	Na	≈ 3.5 gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase (W) 02/14
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation (W) 02/14
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 2
 Composite Lab ID.: 31243-101 Composite Final Volume: ~ 23g
 Composite Matrix: Solid Composite Container(s): 8x 3.5 gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1545
 Initials: MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
R	31242-003	Solid	None	SOME	~ 14g	moist dark gray mud, some shells excluded
S	31242-004	Solid	None	SOME	~ 14g	moist dark gray mud, some shells exclude

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 3
 Composite Lab ID.: 31243-102 Composite Final Volume: ≈ 28 gal
 Composite Matrix: Solid Composite Container(s): 8x 3.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 2030
 Initials: GRS/MS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
US-1	31242-019	S	-	≈ 10 ml	≈ 1/4 gal	leaves, sticks
US-2	31242-020	S	-	≈ 10 ml	≈ 1/4 gal	leaves, sticks

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 4
 Composite Lab ID.: 31243-103 Composite Final Volume: ~28gal
 Composite Matrix: Solid Composite Container(s): 8x3.5gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1000
 Initials: BG/LAG
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
DS-1	31242-012	S	—	~80ml	~14gal	
DS-2	31242-03-029	S	—	~100% L rocks	~14gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 5
 Composite Lab ID.: 31243-104 Composite Final Volume: ≈ 28 gal
 Composite Matrix: Solid Composite Container(s): 8 × 2.5 gal
 Composite Prepared Date: 10/25/18
 Composite Prepared Time: 1110
 Initials: CFS
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
TB-1	31243-104 31243-1010	S	Na	2 Shells	≈ 14 gal	
TB-2	31243-104 31243-1011	S	Na	Leaves	≈ 14 gal	

Subsamples Removed:

Lab Number	Sample Use
31244	L.p. 10-Day Solid Phase
31245	A.b. 10-Day Solid Phase
31246	Elutriate Preparation
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Laboratory Composite Preparation Documentation

Project Number: 31242
 Project Name: New Haven Harbor
 Composite Identifier: Composite 6
 Composite Lab ID.: 31243-105 Composite Final Volume: ≈31gal
 Composite Matrix: Solid Composite Container(s): 9x3.5gal
 Composite Prepared Date: 10/24/18
 Composite Prepared Time: 1115
 Initials: BG/JTP
 Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
CAD-1	31242-005	S	—	≈1L	≈10gal	shells and rocks excluded ↓ All blade sediment with a petroleum smell.
CAD-2	31242-006	S	—	≈500.0L	≈7gal	
CAD-3	31242-007	S	—	≈1L	≈14gal	

Subsamples Removed:

Lab Number	Sample Use
31246	Elutriate Preparation
31244	L.p. 10 Day Solid Phase
31245	A.b. 10 Day Solid Phase
31249	M.n. 28-Day Bioaccumulation
31250	N.v. 28-Day Bioaccumulation

Macoma nasuta
28 day Bioaccumulation Evaluation
Bench Data

28 DAY BIOACCUMULATION ASSAY

Project: New Haven Harbor 2018	Client: AECOM	
Study #: 31249	Reference: CLDS	Water Bath: TCR
Sample(s): Comps 2, 3, 4, 5 and 6	Start: 11/21/2018	End: 12/19/2018

Summary of Test Conditions

Exposure	Species Used
<p>Test Mode: Flow Through (6 volume additions per day)</p> <p>Length of Assay: 28 days</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input type="checkbox"/> Polychaete (<i>Nereis virens</i>)</p> <p><input checked="" type="checkbox"/> Bivalve Clam (<i>Macoma nasuta</i>)</p>

Water Quality Parameters

<p>Salinity: 30 ± 2 ppt</p> <p>Photoperiod: 16 hour light, 8 hour dark</p>	<p>Temperature: 12-16°C with no readings to exceed ±3°C</p>
--	--

Test Chamber	Solution & Sediment Volume
<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 38L (10 gallon) Aquaria</p> <p><input type="checkbox"/> other _____</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> ~6L per vessel of homogenized sediment</p> <p><input checked="" type="checkbox"/> 20-30L overlying water</p> <p><input type="checkbox"/> other _____</p>

Replicate Information

N. virens and *M. nasuta*:

- 5 Reps per sample site and reference site
- 20 organisms per chamber
- 5 Reps for Laboratory Control

Cleaning	Treatments
<p>Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed then rinsed with deionized water (EPA 2002).</p>	<p>Laboratory Control, Reference Site, and Site Sediments</p>

Feeding

<i>N. virens</i> :	<i>M. nasuta</i> :
NONE	NONE

Date: 2/14/18

Initial: NR



^{(E) DV 11/13}
~~99AR001~~

99MnAR011318

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Macoma nasuta

Source: Lab reared _____ Hatchery reared _____ Field collected

Hatch date Mixed ages Receipt date 11/13/18

Lot number 111318MN Strain WILD

Brood origination WA

II. Water Quality

Temperature 14 °C Salinity 30 ppt D.O. sat ppm

pH 8.3 su Hardness _____ ppm Alkalinity _____ ppm

III. Culture Conditions

Freshwater _____ Saltwater Other _____

Recirculating _____ Flow through Static renewal _____

DIET: Flake food _____ Phytoplankton Trout chow _____

Artemia _____ Rotifers _____ YCT _____ Other _____

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: ESI # of Organisms 1100

Carrier: FedEx Date shipped 11/13/18

Biologist: Stam Smitko

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

Macoma nasuta 28 Day Study

Client: AECOM

Study: 31249

Day	Date	Water Qualities and Flow	Initial	Day	Date	Water Qualities and Flow	Initial
0	11/21/18	✓	BG	15	12/06/18	✓	BG
1	11/22/18	✓	LAG	16	12/07/18	✓	BG
2	11/22/18	✓	LAG	17	12/08/18	✓	BG
3	11/24/18	✓	BG	18	12/09/18	✓	MS
4	11/25/18	✓	LAG	19	12/10/18	✓	MS
5	11/26/18	✓	MS	20	12/11/18	✓	MS
6	11/27/18	✓	MS	21	12/12/18	✓	MS
7	11/28/18	✓	LAG	22	12/13/18	✓	MS
8	11/29/18	✓	BG	23	12/14/18	✓	BG
9	11/30/18	✓	BG	24	12/15/18	✓	BG
10	12/01/18	✓	BG	25	12/16/18	✓	MS
11	12/02/18	✓	MS	26	12/17/18	✓	MS
12	12/03/18	✓	MS	27	12/18/18	✓	MS
13	12/04/18	✓	MS	28	12/19/18	✓	LAG ⁽²⁾
14	12/05/18	✓	MS				

Notes: (E10) BG 12/01/18 Low salinities observed, salinity increased in head tanks.

Client: AECOM		Daily Observations for <i>Macoma nasuta</i>												Study: 31249	
TANK	DAY														
	Rep	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Laboratory Control	A	✓	✓	✓	✓	✓	✓	15	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	C	✓	✓	✓	✓	✓	✓	15	✓	✓	✓	✓	✓	✓	15
Laboratory Control	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	B	✓ IR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	E	✓ IR	✓	✓	✓	✓	✓	15	✓	✓	✓	✓	✓	✓	✓
Composite 2	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	B	✓	✓	15	15	15	15	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	C	✓ IR	✓	✓	✓	✓	✓	✓	15	15	15	15	15	15	15
Composite 2	D	✓ IR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	A	✓	✓	15	15	15	15	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	B	✓	✓	✓	15	15	15	15	✓	✓	✓	✓	✓	✓	✓
Composite 3	C	✓	✓	✓	✓	✓	✓	15	✓	✓	✓	✓	✓	✓	✓
Composite 3	D	✓ IR	✓	✓	✓	✓	✓	15	✓	✓	✓	✓	✓	✓	✓
Composite 3	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initial Date		11/22/18 LAG	LAG	B6	LAG	MS	MS	LAG	B6	B6	B6	MS	MS	B6	MS
		11/22/18	11/23/18	11/24/18	11/25/18	11/26/18	11/27/18	11/28/18	11/29/18	11/30/18	12/01/18	12/02/18	12/03/18	12/04/18	12/05/18

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Macoma nasuta</i>												Study: 31249	
TANK	DAY														
	Rep	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Composite 4	A	✓ R	✓	✓	15	15	15	15	✓	✓	1D	✓	✓	✓	✓
Composite 4	B	✓	✓	15	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 4	C	✓ R	✓	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 4	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 4	E	✓	✓	✓	15	15	15	15	15	15	15	15	✓	✓	15
Composite 5	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15	15
Composite 5	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 5	C	✓	✓	25	25	25	25	25	25	25	25	25	25	✓	✓
Composite 5	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 5	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 6	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 6	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15
Composite 6	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 6	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 6	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initial Date		LAG 11/22/18	LAG 11/23/18	BSG 11/24/18	LAG 11/25/18	MS 11/26/18	MS 11/27/18	LAG 11/28/18	BSG 11/29/18	BSG 11/30/18	BSG 12/01/18	MS 12/02/18	MS 12/03/18	BSG 12/04/18	MS 12/05/18

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Macoma nasuta</i>												Study: 31249
TANK	DAY													
	Rep	15	16	17	18	19	20	21	22	23	24	25	26	27
Laboratory Control	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	C	1S	1S	1S	1S	1S	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	C	✓	1S	1S	1S	1S	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initial Date		B6 12/06/18	B6 12/07/18	B6 12/08/18	MS 12/09/18	MS 12/10/18	MS 12/11/18	MS 12/12/18	MS 12/13/18	B6 12/14/18	B6 12/15/18	MS 12/16/18	MS 12/17/18	MS 12/18/18

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Macoma nasuta</i>													Study: 31249
TANK	DAY														
	Rep	15	16	17	18	19	20	21	22	23	24	25	26	27	
Composite 4	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	E	✓	1S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	A	1S	1S	1S	1S	1S	✓	✓	✓	1S	1S	1S	1S	✓	
Composite 5	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	B	✓	1S	1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Initial		B6	B6	B6	MS	MS	MS	MS	MS	B6	B6	MS	MS	MS	
Date		12/06/18	12/07/18	12/08/18	12/09/18	12/10/18	12/11/18	12/12/18	12/13/18	12/14/18	12/15/18	12/16/18	12/17/18	12/18/18	

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Macoma nasuta Day 28 Recovery Record

DATE: 12/19/18

ESI STUDY: 31249

CLIENT: AECOM

PROJECT: New Haven Harbor

SAMPLE ID	REP	# LIVE / INITIALS	SAMPLE ID	REP	# LIVE / INITIALS
Laboratory Control Sediment	A	20 MS	Composite 2	A	20 MS
Laboratory Control Sediment	B	19 LAG	Composite 2	B	20 BG
Laboratory Control Sediment	C	20 MS	Composite 2	C	20 LAG
Laboratory Control Sediment	D	^{ES LAG 12/19} 19 LAG 20	Composite 2	D	20 MS
Laboratory Control Sediment	E	20 MS	Composite 2	E	20 BG
CLDS Reference Sediment	A	20 LAG	Composite 3	A	20 MS
CLDS Reference Sediment	B	20 BG	Composite 3	B	20 LAG
CLDS Reference Sediment	C	^{ES MS 12/19} 20 MS	Composite 3	C	18 BG
CLDS Reference Sediment	D	20 LAG _{ES LAG 12/19}	Composite 3	D	20 MS
CLDS Reference Sediment	E	19 BG	Composite 3	E	20 LAG

^{ES} LAG 12/19 1 native clam found, NOT included in final count

^{ES} MS 12/19 1 Native clam found, NOT part of final count

Macoma nasuta Day 28 Recovery Record

DATE: 12/19/18

ESI STUDY: 31249

CLIENT: AECOM

PROJECT: New Haven Harbor

SAMPLE ID	REP	# LIVE / INITIALS	SAMPLE ID	REP	# LIVE / INITIALS
Composite 4	A	20 19 MS MS 12/19	Composite 6	A	20 MS
Composite 4	B	18 MS	Composite 6	B	20 LAG
Composite 4	C	19 LAG	Composite 6	C	18 BG
Composite 4	D	20 MS	Composite 6	D	22 MS
Composite 4	E	21 LAG	Composite 6	E	20 BG
Composite 5	A	18 MS			
Composite 5	B	18 BG			
Composite 5	C	18 LAG			
Composite 5	D	20 MS			
Composite 5	E	20 BG			

Macoma nasuta
28 day Bioaccumulation Evaluation
Daily Water Quality Data

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	00	11/21/2018 02:26:57	11.7	7.59	84.5	7.63	46374	30.02
Laboratory Control	B	00	11/21/2018 02:27:22	11.7	8.68	97.7	7.73	48377	31.46
Laboratory Control	C	00	11/21/2018 02:27:41	11.5	8.79	98.4	7.74	48041	31.21
Laboratory Control	D	00	11/21/2018 02:28:04	11.4	7.91	87.7	7.68	46617	30.18
Laboratory Control	E	00	11/21/2018 02:28:29	11.3	8.08	89.5	7.65	46807	30.31
CLDS Reference	A	00	11/21/2018 02:28:48	11.3	8.53	94.8	7.75	47285	30.65
CLDS Reference	B	00	11/21/2018 02:29:16	11.3	8.93	99.1	7.77	47089	30.51
CLDS Reference	C	00	11/21/2018 02:29:40	11.3	8.27	91.8	7.79	46939	30.40
CLDS Reference	D	00	11/21/2018 02:30:06	11.4	8.63	95.7	7.80	46830	30.33
CLDS Reference	E	00	11/21/2018 02:30:31	11.5	8.78	97.7	7.81	46945	30.42
Composite 2	A	00	11/21/2018 02:30:51	11.6	8.44	94.5	7.77	47940	31.14
Composite 2	B	00	11/21/2018 02:31:19	11.7	8.59	96.0	7.76	46950	30.43
Composite 2	C	00	11/21/2018 02:31:47	11.6	7.97	89.4	7.72	47913	31.12
Composite 2	D	00	11/21/2018 02:32:07	11.4	7.79	85.9	7.70	45231	29.19
Composite 2	E	00	11/21/2018 02:32:28	11.4	8.33	92.6	7.73	47040	30.48
Composite 3	A	00	11/21/2018 02:32:52	11.4	7.85	86.7	7.70	45894	29.66
Composite 3	B	00	11/21/2018 02:33:18	11.3	8.32	90.9	7.69	44012	28.31
Composite 3	C	00	11/21/2018 02:33:43	11.3	8.44	93.3	7.71	46174	29.86
Composite 3	D	00	11/21/2018 02:34:05	11.3	8.90	97.7	7.81	44900	28.94
Composite 3	E	00	11/21/2018 02:34:28	11.3	8.63	94.1	7.78	43464	27.92
Composite 4	A	00	11/21/2018 02:34:52	11.4	8.67	95.9	7.79	45991	29.73
Composite 4	B	00	11/21/2018 02:35:11	11.7	8.71	98.1	7.81	48500	31.55
Composite 4	C	00	11/21/2018 02:35:15	11.7	8.72	98.1	7.81	48500	31.55
Composite 4	D	00	11/21/2018 02:35:41	11.4	8.97	99.1	7.88	45791	29.59
Composite 4	E	00	11/21/2018 02:38:29	11.5	7.97	88.4	7.77	45795	29.59
Composite 5	A	00	11/21/2018 02:38:53	11.5	8.99	99.1	7.90	44654	28.78
Composite 5	B	00	11/21/2018 02:39:12	11.7	8.60	96.6	7.86	47888	31.11
Composite 5	C	00	11/21/2018 02:39:37	11.4	8.94	98.6	7.95	45293	29.23
Composite 5	D	00	11/21/2018 02:40:03	11.3	9.01	99.2	7.93	45198	29.16
Composite 5	E	00	11/21/2018 02:40:26	11.5	8.94	99.7	7.88	47767	31.01
Composite 6	A	00	11/21/2018 02:40:54	11.3	8.79	96.5	7.86	44737	28.83
Composite 6	B	00	11/21/2018 02:41:23	11.4	8.90	98.7	7.91	46758	30.28
Composite 6	C	00	11/21/2018 02:41:54	11.5	8.70	97.0	7.86	47151	30.57
Composite 6	D	00	11/21/2018 02:42:18	11.8	8.62	97.0	7.86	48033	31.21
Composite 6	E	00	11/21/2018 02:42:42	11.9	8.72	98.6	7.87	48718	31.71
Laboratory Control	A	01	11/22/2018 09:48:56	11.8	6.74	74.8	7.27	47418	30.77
Laboratory Control	B	01	11/22/2018 09:49:30	11.8	7.79	87.0	7.32	49139	32.01
Laboratory Control	C	01	11/22/2018 09:49:53	11.6	8.52	94.7	7.31	48955	31.87
Laboratory Control	D	01	11/22/2018 09:50:18	11.5	7.88	86.9	7.38	47677	30.94
Laboratory Control	E	01	11/22/2018 09:50:45	11.5	8.21	90.6	7.44	47949	31.14
CLDS Reference	A	01	11/22/2018 09:51:15	11.5	7.26	80.3	7.52	48189	31.31
CLDS Reference	B	01	11/22/2018 09:51:43	11.4	8.98	98.9	7.63	48086	31.23
CLDS Reference	C	01	11/22/2018 09:52:09	11.4	8.75	96.4	7.66	47919	31.11

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
CLDS Reference	D	01	11/22/2018 09:52:37	11.4	8.75	96.4	7.69	47824	31.05
CLDS Reference	E	01	11/22/2018 09:53:03	11.5	8.74	96.6	7.71	47959	31.15
Composite 2	A	01	11/22/2018 09:53:35	11.6	8.34	92.6	7.69	48769	31.74
Composite 2	B	01	11/22/2018 09:54:03	11.6	8.74	96.7	7.77	47889	31.10
Composite 2	C	01	11/22/2018 09:54:36	11.6	8.39	93.4	7.72	48803	31.76
Composite 2	D	01	11/22/2018 09:55:03	11.5	7.86	86.2	7.68	46307	29.96
Composite 2	E	01	11/22/2018 09:55:29	11.5	7.62	84.1	7.65	48109	31.25
Composite 3	A	01	11/22/2018 09:56:02	11.4	5.26	57.7	7.54	47037	30.48
Composite 3	B	01	11/22/2018 09:56:32	11.2	8.94	96.9	7.77	45050	29.05
Composite 3	C	01	11/22/2018 09:57:08	11.3	8.45	92.7	7.72	47261	30.64
Composite 3	D	01	11/22/2018 09:57:32	11.3	8.68	94.5	7.79	45871	29.64
Composite 3	E	01	11/22/2018 09:58:02	11.3	8.13	88.0	7.77	44431	28.61
Composite 4	A	01	11/22/2018 09:58:23	11.4	8.34	91.5	7.78	47104	30.53
Composite 4	B	01	11/22/2018 09:58:47	11.6	8.72	96.9	7.80	48898	31.83
Composite 4	C	01	11/22/2018 09:59:07	11.4	8.71	95.5	7.84	46757	30.28
Composite 4	D	01	11/22/2018 09:59:33	11.3	9.03	99.0	7.91	46976	30.43
Composite 4	E	01	11/22/2018 10:00:12	11.5	5.49	60.3	7.69	46833	30.34
Composite 5	A	01	11/22/2018 10:00:43	11.5	9.02	98.6	7.91	45651	29.49
Composite 5	B	01	11/22/2018 10:01:09	11.7	8.63	95.9	7.83	48749	31.73
Composite 5	C	01	11/22/2018 10:01:37	11.4	9.15	100.0	7.97	46323	29.96
Composite 5	D	01	11/22/2018 10:02:01	11.3	9.06	98.8	7.95	46260	29.92
Composite 5	E	01	11/22/2018 10:02:29	11.4	9.07	100.3	7.92	48745	31.71
Composite 6	A	01	11/22/2018 10:03:01	11.3	8.45	91.8	7.87	45602	29.44
Composite 6	B	01	11/22/2018 10:03:30	11.2	9.03	99.1	7.91	47998	31.16
Composite 6	C	01	11/22/2018 10:03:55	11.4	8.81	97.2	7.89	48218	31.33
Composite 6	D	01	11/22/2018 10:04:19	11.7	8.54	95.0	7.87	48834	31.79
Composite 6	E	01	11/22/2018 10:04:44	11.7	8.86	98.7	7.88	48815	31.78
Laboratory Control	A	02	11/23/2018 10:02:25	12.3	8.26	91.7	7.68	47440	30.81
Laboratory Control	B	02	11/23/2018 10:02:46	12.1	8.51	94.3	7.67	47737	31.01
Laboratory Control	C	02	11/23/2018 10:03:11	11.7	8.51	93.6	7.57	47880	31.10
Laboratory Control	D	02	11/23/2018 10:03:46	11.6	8.58	93.9	7.66	47081	30.52
Laboratory Control	E	02	11/23/2018 10:04:09	11.6	8.49	92.8	7.67	47171	30.58
CLDS Reference	A	02	11/23/2018 10:04:35	11.5	7.24	79.1	7.64	47191	30.60
CLDS Reference	B	02	11/23/2018 10:04:59	11.5	9.08	99.1	7.73	47203	30.60
CLDS Reference	C	02	11/23/2018 10:05:21	11.5	8.92	97.5	7.74	47085	30.52
CLDS Reference	D	02	11/23/2018 10:05:37	11.6	8.89	97.1	7.75	46878	30.37
CLDS Reference	E	02	11/23/2018 10:05:45	11.6	8.87	96.9	7.75	46880	30.38
Composite 2	A	02	11/23/2018 10:06:08	11.8	8.77	96.2	7.75	47028	30.49
Composite 2	B	02	11/23/2018 10:06:32	11.9	8.53	94.0	7.75	47548	30.87
Composite 2	C	02	11/23/2018 10:07:00	12.0	8.88	97.9	7.83	46918	30.42
Composite 2	D	02	11/23/2018 10:07:26	11.7	8.67	95.3	7.79	47741	31.00
Composite 2	E	02	11/23/2018 10:07:44	11.7	8.23	89.9	7.76	46260	29.93
Composite 3	A	02	11/23/2018 10:08:04	11.6	8.01	87.8	7.72	47338	30.71

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 3	B	02	11/23/2018 10:08:20	11.6	8.10	88.5	7.71	46626	30.19
Composite 3	C	02	11/23/2018 10:08:42	11.4	8.97	96.4	7.86	44202	28.45
Composite 3	D	02	11/23/2018 10:09:07	11.6	8.72	95.3	7.82	46994	30.46
Composite 3	E	02	11/23/2018 10:09:29	11.5	8.68	94.3	7.84	45892	29.66
Composite 4	A	02	11/23/2018 10:09:46	11.5	8.61	92.8	7.84	44283	28.51
Composite 4	B	02	11/23/2018 10:10:08	11.6	8.45	91.3	7.82	44483	28.66
Composite 4	C	02	11/23/2018 10:10:30	11.9	8.86	97.7	7.82	47634	30.93
Composite 4	D	02	11/23/2018 10:10:46	11.7	8.84	96.7	7.85	46541	30.14
Composite 4	E	02	11/23/2018 10:11:05	11.7	8.99	98.2	7.91	46383	30.02
Composite 5	A	02	11/23/2018 10:11:36	11.7	7.44	81.3	7.76	46424	30.05
Composite 5	B	02	11/23/2018 10:11:59	11.6	9.00	97.5	7.94	45146	29.13
Composite 5	C	02	11/23/2018 10:12:14	11.7	8.85	97.3	7.88	47656	30.94
Composite 5	D	02	11/23/2018 10:12:33	11.5	9.12	99.0	7.97	45842	29.63
Composite 5	E	02	11/23/2018 10:12:55	11.5	9.04	97.9	7.96	45737	29.55
Composite 6	A	02	11/23/2018 10:13:12	11.6	9.06	99.3	7.92	47733	30.99
Composite 6	B	02	11/23/2018 10:13:39	11.4	8.65	93.2	7.88	44921	28.96
Composite 6	C	02	11/23/2018 10:14:03	11.4	9.11	99.1	7.90	47158	30.57
Composite 6	D	02	11/23/2018 10:14:16	11.6	9.00	98.4	7.89	47231	30.63
Composite 6	E	02	11/23/2018 10:14:39	12.0	8.89	98.2	7.87	47495	30.84
Laboratory Control	A	03	11/24/2018 12:42:27	12.0	8.64	96.2	7.68	45600	29.48
Laboratory Control	B	03	11/24/2018 12:42:43	11.9	8.77	97.3	7.70	45529	29.42
Laboratory Control	C	03	11/24/2018 12:43:08	11.7	8.78	97.3	7.66	46348	30.00
Laboratory Control	D	03	11/24/2018 12:43:27	11.6	8.83	97.7	7.70	46019	29.76
Laboratory Control	E	03	11/24/2018 12:43:46	11.5	8.77	96.9	7.71	46320	29.97
CLDS Reference	A	03	11/24/2018 12:44:08	11.4	7.67	84.7	7.67	46616	30.18
CLDS Reference	B	03	11/24/2018 12:44:33	11.3	9.03	99.4	7.77	46585	30.15
CLDS Reference	C	03	11/24/2018 12:44:55	11.5	8.96	98.7	7.78	46140	29.84
CLDS Reference	D	03	11/24/2018 12:45:16	11.4	8.91	98.2	7.79	46367	30.00
CLDS Reference	E	03	11/24/2018 12:45:32	11.6	8.88	98.3	7.79	46511	30.11
Composite 2	A	03	11/24/2018 12:45:57	11.7	8.64	96.0	7.82	46802	30.32
Composite 2	B	03	11/24/2018 12:46:22	11.8	8.74	96.8	7.85	45936	29.71
Composite 2	C	03	11/24/2018 12:46:52	11.7	8.66	96.2	7.82	46829	30.34
Composite 2	D	03	11/24/2018 12:47:18	11.7	8.55	94.5	7.81	45584	29.45
Composite 2	E	03	11/24/2018 12:47:32	11.7	8.50	94.2	7.78	46087	29.81
Composite 3	A	03	11/24/2018 12:47:50	11.7	8.67	95.9	7.79	45663	29.51
Composite 3	B	03	11/24/2018 12:48:56	11.2	8.77	95.4	7.93	44456	28.62
Composite 3	C	03	11/24/2018 12:49:21	11.5	8.62	95.0	7.86	46025	29.76
Composite 3	D	03	11/24/2018 12:49:46	11.4	8.80	96.6	7.88	45539	29.41
Composite 3	E	03	11/24/2018 12:50:00	11.5	8.68	95.1	7.86	44667	28.78
Composite 4	A	03	11/24/2018 12:50:19	11.4	8.40	92.4	7.84	45902	29.67
Composite 4	B	03	11/24/2018 12:50:37	11.4	8.75	96.8	7.85	47222	30.61
Composite 4	C	03	11/24/2018 12:50:53	11.7	8.81	97.4	7.87	45721	29.55
Composite 4	D	03	11/24/2018 12:51:14	11.6	8.89	98.1	7.94	45957	29.71

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	E	03	11/24/2018 12:52:06	11.8	8.59	95.1	7.88	45641	29.49
Composite 5	A	03	11/24/2018 12:52:19	11.5	8.80	96.7	7.96	45039	29.05
Composite 5	B	03	11/24/2018 12:52:42	11.9	8.86	98.4	7.90	45695	29.54
Composite 5	C	03	11/24/2018 12:53:05	11.4	9.03	99.2	8.00	45570	29.43
Composite 5	D	03	11/24/2018 12:53:21	11.5	8.96	98.5	7.97	45422	29.32
Composite 5	E	03	11/24/2018 12:53:39	11.5	9.04	99.7	7.94	45855	29.64
Composite 6	A	03	11/24/2018 12:54:05	11.2	8.61	94.0	7.90	44936	28.97
Composite 6	B	03	11/24/2018 12:54:27	11.4	8.88	97.8	7.90	45928	29.68
Composite 6	C	03	11/24/2018 12:54:44	11.7	8.88	98.3	7.90	45931	29.70
Composite 6	D	03	11/24/2018 12:55:06	12.0	8.87	98.4	7.89	45137	29.14
Composite 6	E	03	11/24/2018 12:55:30	11.4	8.86	98.0	7.88	47243	30.63
Laboratory Control	A	04	11/25/2018 12:14:39	12.1	8.31	93.8	7.75	46369	30.03
Laboratory Control	B	04	11/25/2018 12:15:22	11.9	8.36	93.9	7.72	46277	29.96
Laboratory Control	C	04	11/25/2018 12:15:59	11.8	8.88	99.7	7.74	46411	30.05
Laboratory Control	D	04	11/25/2018 12:16:46	11.8	8.77	98.6	7.78	46404	30.04
Laboratory Control	E	04	11/25/2018 12:17:20	11.8	8.67	97.3	7.77	46438	30.07
CLDS Reference	A	04	11/25/2018 12:17:55	11.7	9.05	101.5	7.82	46447	30.07
CLDS Reference	B	04	11/25/2018 12:18:40	11.4	9.12	101.6	7.85	46583	30.15
CLDS Reference	C	04	11/25/2018 12:19:07	11.6	8.97	100.1	7.84	46379	30.01
CLDS Reference	D	04	11/25/2018 12:19:38	11.5	8.95	99.8	7.84	46532	30.12
CLDS Reference	E	04	11/25/2018 12:20:10	11.7	8.92	99.9	7.84	46418	30.05
Composite 2	A	04	11/25/2018 12:20:39	11.8	8.43	94.6	7.84	46486	30.10
Composite 2	B	04	11/25/2018 12:21:15	11.8	8.76	98.3	7.85	46499	30.11
Composite 2	C	04	11/25/2018 12:21:44	11.8	8.92	100.1	7.87	46336	29.99
Composite 2	D	04	11/25/2018 12:22:18	11.8	8.68	97.4	7.84	46418	30.05
Composite 2	E	04	11/25/2018 12:22:38	11.8	8.56	95.9	7.82	46226	29.92
Composite 3	A	04	11/25/2018 12:23:08	11.8	8.50	95.4	7.80	46314	29.98
Composite 3	B	04	11/25/2018 12:23:28	11.9	8.56	96.3	7.79	46388	30.04
Composite 3	C	04	11/25/2018 12:23:59	11.4	8.88	98.3	7.92	45266	29.21
Composite 3	D	04	11/25/2018 12:24:27	11.7	8.68	97.1	7.84	46354	30.00
Composite 3	E	04	11/25/2018 12:25:02	11.6	8.73	97.3	7.85	46194	29.88
Composite 4	A	04	11/25/2018 12:25:47	11.6	8.66	96.7	7.83	45998	29.74
Composite 4	B	04	11/25/2018 12:26:18	11.6	8.50	94.8	7.84	46287	29.95
Composite 4	C	04	11/25/2018 12:26:47	11.6	8.77	98.2	7.86	47023	30.48
Composite 4	D	04	11/25/2018 12:27:06	11.8	8.71	97.8	7.85	46376	30.02
Composite 4	E	04	11/25/2018 12:27:24	11.7	8.88	99.3	7.87	46357	30.00
Composite 5	A	04	11/25/2018 12:28:35	11.9	8.52	95.8	7.83	46345	30.00
Composite 5	B	04	11/25/2018 12:29:05	11.7	8.95	99.7	7.97	45625	29.48
Composite 5	C	04	11/25/2018 12:29:33	12.1	8.62	97.3	7.87	46424	30.07
Composite 5	D	04	11/25/2018 12:29:56	11.7	8.86	98.9	7.94	46059	29.79
Composite 5	E	04	11/25/2018 12:30:29	11.6	8.67	96.6	7.90	46031	29.77
Composite 6	A	04	11/25/2018 12:30:57	11.7	8.92	99.9	7.89	46370	30.01
Composite 6	B	04	11/25/2018 12:31:25	11.4	8.50	94.1	7.87	45569	29.42

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	C	04	11/25/2018 12:32:06	11.6	8.82	98.5	7.89	46247	29.92
Composite 6	D	04	11/25/2018 12:32:29	11.8	8.74	98.1	7.88	46301	29.97
Composite 6	E	04	11/25/2018 12:33:21	11.6	8.68	97.3	7.89	47654	30.93
Laboratory Control	A	05	11/26/2018 12:03:40	12.2	8.38	94.6	7.73	46895	30.41
Laboratory Control	B	05	11/26/2018 12:04:07	11.7	7.44	83.1	7.64	46602	30.18
Laboratory Control	C	05	11/26/2018 12:04:32	11.9	8.73	97.9	7.68	46905	30.41
Laboratory Control	D	05	11/26/2018 12:05:07	11.6	8.72	97.2	7.71	46831	30.34
Laboratory Control	E	05	11/26/2018 12:05:33	11.6	8.68	96.8	7.71	46893	30.39
CLDS Reference	A	05	11/26/2018 12:05:52	11.6	9.03	100.7	7.76	46911	30.40
CLDS Reference	B	05	11/26/2018 12:06:29	11.5	9.06	100.8	7.79	46948	30.42
CLDS Reference	C	05	11/26/2018 12:06:51	11.8	8.99	100.6	7.80	46920	30.41
CLDS Reference	D	05	11/26/2018 12:07:14	11.6	8.95	99.6	7.80	46874	30.37
CLDS Reference	E	05	11/26/2018 12:07:36	11.8	8.92	99.9	7.79	46881	30.39
Composite 2	A	05	11/26/2018 12:08:05	11.8	8.74	97.9	7.79	46892	30.39
Composite 2	B	05	11/26/2018 12:08:29	11.8	8.91	99.8	7.82	46795	30.32
Composite 2	C	05	11/26/2018 12:09:09	11.6	7.38	82.2	7.72	46749	30.28
Composite 2	D	05	11/26/2018 12:09:31	11.5	7.95	88.4	7.71	46547	30.13
Composite 2	E	05	11/26/2018 12:09:54	11.4	7.75	86.0	7.67	46588	30.16
Composite 3	A	05	11/26/2018 12:10:19	11.4	7.65	84.8	7.65	46665	30.21
Composite 3	B	05	11/26/2018 12:10:43	11.4	8.84	97.4	7.85	45593	29.44
Composite 3	C	05	11/26/2018 12:11:11	11.6	8.44	94.1	7.76	46846	30.35
Composite 3	D	05	11/26/2018 12:11:34	11.6	8.58	95.6	7.76	46732	30.27
Composite 3	E	05	11/26/2018 12:11:55	11.7	8.64	96.3	7.76	46657	30.22
Composite 4	A	05	11/26/2018 12:12:19	11.6	8.39	93.4	7.78	46665	30.22
Composite 4	B	05	11/26/2018 12:12:38	11.6	8.55	95.5	7.78	47308	30.68
Composite 4	C	05	11/26/2018 12:13:08	11.6	8.37	93.2	7.75	46743	30.28
Composite 4	D	05	11/26/2018 12:13:28	11.7	8.93	99.7	7.80	46871	30.37
Composite 4	E	05	11/26/2018 12:14:32	11.6	8.06	89.6	7.73	46637	30.20
Composite 5	A	05	11/26/2018 12:14:56	11.5	9.07	100.6	7.89	46122	29.83
Composite 5	B	05	11/26/2018 12:15:22	11.5	8.69	96.5	7.79	46624	30.19
Composite 5	C	05	11/26/2018 12:15:48	11.5	8.95	99.3	7.86	46415	30.04
Composite 5	D	05	11/26/2018 12:16:15	11.4	7.80	86.3	7.76	46312	29.96
Composite 5	E	05	11/26/2018 12:16:39	11.3	9.04	99.9	7.82	46629	30.18
Composite 6	A	05	11/26/2018 12:17:18	11.4	7.75	85.6	7.80	45822	29.61
Composite 6	B	05	11/26/2018 12:17:41	11.6	8.78	97.8	7.81	46776	30.30
Composite 6	C	05	11/26/2018 12:18:10	11.5	8.20	91.0	7.78	46613	30.18
Composite 6	D	05	11/26/2018 12:18:34	11.5	7.94	88.1	7.76	46696	30.24
Composite 6	E	05	11/26/2018 12:18:57	11.5	8.41	93.8	7.78	47735	30.99
Laboratory Control	A	06	11/27/2018 09:40:08	12.1	8.27	95.6	7.65	46643	30.23
Laboratory Control	B	06	11/27/2018 09:40:34	11.7	7.10	81.1	7.54	46019	29.76
Laboratory Control	C	06	11/27/2018 09:41:05	11.8	8.56	98.3	7.64	46624	30.20
Laboratory Control	D	06	11/27/2018 09:41:27	11.6	8.60	98.1	7.69	46427	30.05

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	E	06	11/27/2018 09:41:51	11.5	8.47	96.6	7.70	46506	30.10
CLDS Reference	A	06	11/27/2018 09:42:18	11.5	8.92	101.7	7.78	46545	30.13
CLDS Reference	B	06	11/27/2018 09:42:50	11.4	8.81	100.2	7.83	46502	30.10
CLDS Reference	C	06	11/27/2018 09:43:12	11.4	8.76	99.6	7.82	46454	30.06
CLDS Reference	D	06	11/27/2018 09:43:38	11.5	8.83	100.6	7.84	46420	30.04
CLDS Reference	E	06	11/27/2018 09:43:55	11.7	8.76	100.4	7.83	46601	30.18
Composite 2	A	06	11/27/2018 09:44:12	11.8	8.65	99.1	7.83	46483	30.10
Composite 2	B	06	11/27/2018 09:44:30	11.8	8.75	100.3	7.87	46324	29.99
Composite 2	C	06	11/27/2018 09:45:00	11.8	8.04	92.2	7.78	46454	30.08
Composite 2	D	06	11/27/2018 09:45:25	11.7	8.30	94.9	7.78	46307	29.97
Composite 2	E	06	11/27/2018 09:45:49	11.7	8.37	95.9	7.78	46465	30.08
Composite 3	A	06	11/27/2018 09:46:09	11.5	8.06	91.9	7.75	46252	29.92
Composite 3	B	06	11/27/2018 09:46:33	11.6	8.71	99.2	7.86	46079	29.80
Composite 3	C	06	11/27/2018 09:46:58	11.6	8.27	94.4	7.79	46468	30.08
Composite 3	D	06	11/27/2018 09:47:24	11.6	8.41	96.0	7.79	46398	30.03
Composite 3	E	06	11/27/2018 09:48:02	11.6	8.45	96.5	7.80	46375	30.01
Composite 4	A	06	11/27/2018 09:48:16	11.5	8.33	94.9	7.80	46177	29.87
Composite 4	B	06	11/27/2018 09:48:34	11.6	8.21	93.7	7.80	46564	30.15
Composite 4	C	06	11/27/2018 09:48:50	11.6	8.16	93.1	7.78	46257	29.93
Composite 4	D	06	11/27/2018 09:49:15	11.7	8.76	100.2	7.85	46574	30.16
Composite 4	E	06	11/27/2018 09:50:27	11.5	8.18	93.1	7.80	46076	29.80
Composite 5	A	06	11/27/2018 09:50:51	11.5	8.85	100.5	7.96	45735	29.55
Composite 5	B	06	11/27/2018 09:51:13	11.5	8.47	96.3	7.87	45987	29.73
Composite 5	C	06	11/27/2018 09:51:40	11.5	8.76	99.5	7.93	45950	29.70
Composite 5	D	06	11/27/2018 09:52:12	11.4	7.44	84.3	7.78	45738	29.55
Composite 5	E	06	11/27/2018 09:53:14	11.2	8.92	100.9	7.92	46007	29.73
Composite 6	A	06	11/27/2018 10:01:50	11.4	7.59	85.7	7.82	45200	29.16
Composite 6	B	06	11/27/2018 10:02:19	11.6	8.64	98.6	7.86	46471	30.08
Composite 6	C	06	11/27/2018 10:02:47	11.5	8.02	91.2	7.82	46105	29.81
Composite 6	D	06	11/27/2018 10:03:16	11.4	7.74	88.0	7.79	46097	29.81
Composite 6	E	06	11/27/2018 10:03:45	11.5	8.21	93.7	7.84	47029	30.48
Laboratory Control	A	07	11/28/2018 12:08:47	12.4	8.94	101.2	7.82	41664	26.69
Laboratory Control	B	07	11/28/2018 12:09:47	12.2	8.84	99.7	7.80	41535	26.59
Laboratory Control	C	07	11/28/2018 12:10:24	12.1	8.88	99.9	7.78	41609	26.64
Laboratory Control	D	07	11/28/2018 12:11:47	11.9	8.94	100.1	7.81	41396	26.48
Laboratory Control	E	07	11/28/2018 12:12:35	11.7	8.79	98.1	7.79	41420	26.49
CLDS Reference	A	07	11/28/2018 12:13:26	11.8	9.13	102.2	7.83	41527	26.57
CLDS Reference	B	07	11/28/2018 12:14:38	11.5	9.15	101.6	7.85	41319	26.41
CLDS Reference	C	07	11/28/2018 12:15:08	11.6	9.05	100.7	7.84	41275	26.38
CLDS Reference	D	07	11/28/2018 12:15:31	11.6	9.08	101.0	7.84	41207	26.34
CLDS Reference	E	07	11/28/2018 12:16:12	11.7	8.94	99.7	7.83	41413	26.48
Composite 2	A	07	11/28/2018 12:16:48	11.8	8.88	99.1	7.84	41322	26.42
Composite 2	B	07	11/28/2018 12:17:20	11.8	9.00	100.5	7.86	41206	26.34

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	C	07	11/28/2018 12:20:49	11.9	8.47	95.0	7.80	41386	26.47
Composite 2	D	07	11/28/2018 12:21:18	11.9	8.65	96.8	7.80	41212	26.35
Composite 2	E	07	11/28/2018 12:22:03	11.9	8.60	96.4	7.80	41460	26.53
Composite 3	A	07	11/28/2018 12:22:43	11.7	8.42	93.7	7.78	40980	26.18
Composite 3	B	07	11/28/2018 12:23:30	11.7	8.80	97.9	7.85	41121	26.28
Composite 3	C	07	11/28/2018 12:24:06	11.7	8.75	97.6	7.81	41376	26.46
Composite 3	D	07	11/28/2018 12:24:46	11.7	8.78	97.9	7.81	41362	26.45
Composite 3	E	07	11/28/2018 12:25:46	11.6	8.70	96.7	7.81	41278	26.38
Composite 4	A	07	11/28/2018 12:26:41	11.5	8.78	97.3	7.84	40899	26.11
Composite 4	B	07	11/28/2018 12:27:26	11.6	8.76	97.4	7.82	41272	26.38
Composite 4	C	07	11/28/2018 12:27:56	11.7	8.76	97.6	7.82	41204	26.34
Composite 4	D	07	11/28/2018 12:28:37	11.6	9.04	100.7	7.85	41525	26.56
Composite 4	E	07	11/28/2018 12:29:23	11.9	8.80	98.3	7.84	41030	26.22
Composite 5	A	07	11/28/2018 12:30:42	11.6	9.08	100.7	7.97	40663	25.95
Composite 5	B	07	11/28/2018 12:31:38	11.6	8.84	98.1	7.88	40530	25.86
Composite 5	C	07	11/28/2018 12:32:14	11.7	9.02	100.5	7.92	40949	26.16
Composite 5	D	07	11/28/2018 12:33:05	11.6	8.40	93.1	7.83	40483	25.82
Composite 5	E	07	11/28/2018 13:27:21	11.7	9.01	100.2	7.93	40846	26.08
Composite 6	A	07	11/28/2018 13:28:02	11.7	8.63	95.7	7.90	40364	25.74
Composite 6	B	07	11/28/2018 13:28:56	11.8	8.86	99.1	7.89	41469	26.53
Composite 6	C	07	11/28/2018 13:29:38	11.8	8.84	98.8	7.87	41177	26.32
Composite 6	D	07	11/28/2018 13:30:26	11.5	8.39	92.9	7.83	40681	25.96
Composite 6	E	07	11/28/2018 13:31:08	11.7	8.86	98.9	7.87	41452	26.51
Laboratory Control	A	08	11/29/2018 11:11:07	12.0	8.17	92.6	7.61	46901	30.41
Laboratory Control	B	08	11/29/2018 11:11:47	11.8	8.00	90.4	7.61	47174	30.60
Laboratory Control	C	08	11/29/2018 11:12:19	11.9	8.58	97.0	7.66	46736	30.28
Laboratory Control	D	08	11/29/2018 11:12:42	11.6	8.64	97.1	7.70	47011	30.47
Laboratory Control	E	08	11/29/2018 11:13:07	11.6	8.56	96.3	7.71	46825	30.34
CLDS Reference	A	08	11/29/2018 11:13:31	11.4	8.75	98.0	7.75	47070	30.50
CLDS Reference	B	08	11/29/2018 11:13:54	11.5	8.83	99.0	7.78	46879	30.37
CLDS Reference	C	08	11/29/2018 11:14:20	11.5	8.79	98.7	7.79	46883	30.37
CLDS Reference	D	08	11/29/2018 11:14:47	11.5	8.74	98.0	7.80	46990	30.45
CLDS Reference	E	08	11/29/2018 11:15:13	11.6	8.64	97.2	7.80	46914	30.40
Composite 2	A	08	11/29/2018 11:15:40	11.8	8.46	95.4	7.80	46774	30.31
Composite 2	B	08	11/29/2018 11:16:02	11.7	8.71	98.1	7.81	46929	30.42
Composite 2	C	08	11/29/2018 11:16:35	11.8	8.10	91.4	7.80	46819	30.34
Composite 2	D	08	11/29/2018 11:16:57	11.8	8.45	95.5	7.79	46802	30.33
Composite 2	E	08	11/29/2018 11:17:17	11.7	8.02	90.4	7.75	47102	30.54
Composite 3	A	08	11/29/2018 11:17:39	11.8	8.43	95.1	7.77	46815	30.34
Composite 3	B	08	11/29/2018 11:18:01	11.9	8.59	97.2	7.80	46602	30.19
Composite 3	C	08	11/29/2018 11:18:26	11.8	8.51	95.9	7.79	46812	30.33
Composite 3	D	08	11/29/2018 11:18:54	11.7	8.52	95.9	7.79	46787	30.31
Composite 3	E	08	11/29/2018 11:19:15	11.6	8.48	95.3	7.78	46879	30.37

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	08	11/29/2018 11:19:31	11.6	8.54	96.0	7.80	46837	30.34
Composite 4	B	08	11/29/2018 11:19:56	11.6	8.62	97.0	7.81	46880	30.38
Composite 4	C	08	11/29/2018 11:20:20	11.6	8.51	95.5	7.80	46900	30.39
Composite 4	D	08	11/29/2018 11:20:34	11.5	8.64	96.9	7.82	47039	30.48
Composite 4	E	08	11/29/2018 11:20:59	11.5	8.19	91.9	7.79	47002	30.46
Composite 5	A	08	11/29/2018 11:21:25	11.5	8.74	97.9	7.89	46634	30.19
Composite 5	B	08	11/29/2018 11:21:48	11.8	8.56	96.5	7.85	46681	30.24
Composite 5	C	08	11/29/2018 11:22:13	11.8	8.55	96.5	7.85	46727	30.28
Composite 5	D	08	11/29/2018 11:22:38	11.7	7.97	89.7	7.81	46663	30.22
Composite 5	E	08	11/29/2018 11:23:03	11.8	8.62	97.1	7.84	46728	30.27
Composite 6	A	08	11/29/2018 11:23:34	11.6	8.24	92.5	7.83	46615	30.19
Composite 6	B	08	11/29/2018 11:23:54	11.6	8.49	95.5	7.83	46976	30.45
Composite 6	C	08	11/29/2018 11:24:12	11.6	8.29	93.1	7.82	46885	30.38
Composite 6	D	08	11/29/2018 11:24:41	11.7	8.48	95.4	7.83	46738	30.28
Composite 6	E	08	11/29/2018 11:25:02	11.7	8.55	96.1	7.84	46893	30.39
Laboratory Control	A	09	11/30/2018 15:07:39	11.8	8.03	90.1	7.36	47978	31.18
Laboratory Control	B	09	11/30/2018 15:08:03	11.6	8.20	91.7	7.40	48560	31.58
Laboratory Control	C	09	11/30/2018 15:08:25	11.7	8.59	96.0	7.47	47716	30.98
Laboratory Control	D	09	11/30/2018 15:08:40	11.3	8.77	97.6	7.51	48218	31.33
Laboratory Control	E	09	11/30/2018 15:09:06	11.4	8.64	95.9	7.55	47869	31.08
CLDS Reference	A	09	11/30/2018 15:09:29	11.1	8.98	99.4	7.61	48207	31.31
CLDS Reference	B	09	11/30/2018 15:09:51	11.1	9.08	100.3	7.66	48064	31.20
CLDS Reference	C	09	11/30/2018 15:10:09	11.1	8.99	99.5	7.67	48105	31.24
CLDS Reference	D	09	11/30/2018 15:10:34	11.2	8.80	97.6	7.68	48204	31.31
CLDS Reference	E	09	11/30/2018 15:10:52	11.3	8.80	97.8	7.68	48321	31.40
Composite 2	A	09	11/30/2018 15:11:16	11.6	8.75	97.6	7.69	47698	30.96
Composite 2	B	09	11/30/2018 15:11:40	11.6	8.78	98.0	7.71	48015	31.19
Composite 2	C	09	11/30/2018 15:12:18	11.5	7.59	84.7	7.63	48159	31.29
Composite 2	D	09	11/30/2018 15:12:42	11.4	8.04	89.5	7.63	48065	31.22
Composite 2	E	09	11/30/2018 15:12:57	11.4	8.02	89.4	7.62	48244	31.35
Composite 3	A	09	11/30/2018 15:13:26	11.6	8.29	92.5	7.66	47779	31.02
Composite 3	B	09	11/30/2018 15:13:44	11.9	8.68	97.3	7.70	47580	30.89
Composite 3	C	09	11/30/2018 15:14:03	11.5	8.69	96.8	7.70	47786	31.02
Composite 3	D	09	11/30/2018 15:14:30	11.5	8.61	95.9	7.70	47732	30.98
Composite 3	E	09	11/30/2018 15:14:54	11.3	8.57	95.1	7.70	47979	31.15
Composite 4	A	09	11/30/2018 15:15:14	11.3	8.50	94.3	7.70	47939	31.12
Composite 4	B	09	11/30/2018 15:15:33	11.3	8.41	93.4	7.70	47999	31.17
Composite 4	C	09	11/30/2018 15:15:55	11.3	8.45	93.8	7.70	47942	31.13
Composite 4	D	09	11/30/2018 15:16:17	11.3	8.87	98.5	7.74	47917	31.11
Composite 4	E	09	11/30/2018 15:16:46	11.4	8.03	89.4	7.72	48343	31.42
Composite 5	A	09	11/30/2018 15:16:59	11.3	8.51	94.5	7.77	47939	31.12
Composite 5	B	09	11/30/2018 15:17:23	11.5	8.65	96.4	7.76	47810	31.04
Composite 5	C	09	11/30/2018 15:17:44	11.6	8.76	97.7	7.77	47707	30.97

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	D	09	11/30/2018 15:18:01	11.5	8.24	91.8	7.73	47847	31.07
Composite 5	E	09	11/30/2018 15:18:23	11.6	8.79	98.1	7.76	47661	30.94
Composite 6	A	09	11/30/2018 15:18:58	11.4	7.85	87.1	7.72	47816	31.04
Composite 6	B	09	11/30/2018 15:19:21	11.5	8.57	95.5	7.75	47857	31.07
Composite 6	C	09	11/30/2018 15:19:40	11.4	8.39	93.4	7.74	48043	31.21
Composite 6	D	09	11/30/2018 15:20:02	11.5	8.58	95.5	7.75	47721	30.98
Composite 6	E	09	11/30/2018 15:20:23	11.5	8.74	97.3	7.76	47734	30.99
Laboratory Control	A	10	12/1/2018 10:49:09	12.1	8.97	98.4	7.73	42981	27.61
Laboratory Control	B	10	12/1/2018 10:49:35	11.9	9.12	99.9	7.73	43338	27.86
Laboratory Control	C	10	12/1/2018 10:49:50	12.1	9.35	102.4	7.75	42419	27.21
Laboratory Control	D	10	12/1/2018 10:50:11	12.0	9.32	101.7	7.76	42612	27.34
Laboratory Control	E	10	12/1/2018 10:50:35	11.8	9.31	101.5	7.76	42707	27.40
CLDS Reference	A	10	12/1/2018 10:50:56	11.7	9.48	103.0	7.78	42788	27.46
CLDS Reference	B	10	12/1/2018 10:51:26	11.4	9.38	101.6	7.80	43579	28.01
CLDS Reference	C	10	12/1/2018 10:51:46	11.6	9.44	102.5	7.81	42944	27.57
CLDS Reference	D	10	12/1/2018 10:52:03	11.5	9.36	101.6	7.80	43787	28.16
CLDS Reference	E	10	12/1/2018 10:52:26	11.6	9.30	101.2	7.80	43504	27.96
Composite 2	A	10	12/1/2018 10:52:48	11.7	9.28	101.1	7.80	43189	27.74
Composite 2	B	10	12/1/2018 10:53:07	11.9	9.34	101.9	7.81	42561	27.30
Composite 2	C	10	12/1/2018 10:53:35	11.9	9.31	101.8	7.80	42911	27.55
Composite 2	D	10	12/1/2018 10:53:53	12.0	9.23	101.0	7.80	42953	27.58
Composite 2	E	10	12/1/2018 10:54:17	11.8	9.34	102.1	7.80	43299	27.83
Composite 3	A	10	12/1/2018 10:54:38	11.8	9.23	100.9	7.80	43436	27.92
Composite 3	B	10	12/1/2018 10:54:55	12.0	9.26	101.3	7.80	42612	27.34
Composite 3	C	10	12/1/2018 10:55:22	11.8	9.14	99.7	7.79	43093	27.68
Composite 3	D	10	12/1/2018 10:55:52	11.6	9.16	99.5	7.79	43345	27.85
Composite 3	E	10	12/1/2018 10:56:16	11.6	9.29	101.1	7.80	43307	27.82
Composite 4	A	10	12/1/2018 10:56:44	11.7	9.12	99.3	7.79	43079	27.66
Composite 4	B	10	12/1/2018 10:57:09	11.5	9.09	98.9	7.79	44069	28.36
Composite 4	C	10	12/1/2018 10:57:32	11.6	9.49	103.1	7.82	43021	27.62
Composite 4	D	10	12/1/2018 10:58:09	11.3	9.20	99.8	7.81	44310	28.52
Composite 4	E	10	12/1/2018 10:58:36	11.9	9.21	100.6	7.82	43037	27.64
Composite 5	A	10	12/1/2018 10:58:55	11.5	9.25	101.2	7.86	45202	29.17
Composite 5	B	10	12/1/2018 10:59:16	11.8	9.15	100.0	7.84	43573	28.02
Composite 5	C	10	12/1/2018 10:59:34	11.9	9.24	100.9	7.83	42794	27.47
Composite 5	D	10	12/1/2018 10:59:57	11.7	8.85	96.9	7.80	44380	28.59
Composite 5	E	10	12/1/2018 11:00:21	11.8	9.27	101.2	7.82	43301	27.82
Composite 6	A	10	12/1/2018 11:00:46	11.8	9.24	100.9	7.82	43110	27.69
Composite 6	B	10	12/1/2018 11:01:09	11.8	9.11	99.6	7.82	43388	27.89
Composite 6	C	10	12/1/2018 11:01:31	11.8	9.26	101.2	7.82	43304	27.83
Composite 6	D	10	12/1/2018 11:01:44	11.9	9.19	100.4	7.82	43000	27.61
Composite 6	E	10	12/1/2018 11:02:05	11.7	9.23	100.6	7.82	43267	27.80

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	11	12/2/2018 12:48:46	12.1	9.12	101.9	7.74	44212	28.48
Laboratory Control	B	11	12/2/2018 12:49:12	12.0	9.15	102.0	7.76	44208	28.48
Laboratory Control	C	11	12/2/2018 12:49:34	12.2	9.32	104.5	7.79	44295	28.55
Laboratory Control	D	11	12/2/2018 12:50:08	12.0	9.32	104.1	7.82	44328	28.56
Laboratory Control	E	11	12/2/2018 12:50:34	11.9	9.22	102.7	7.82	44329	28.56
CLDS Reference	A	11	12/2/2018 12:50:54	11.7	9.49	105.2	7.85	44349	28.57
CLDS Reference	B	11	12/2/2018 12:51:24	11.3	9.49	104.3	7.87	44153	28.41
CLDS Reference	C	11	12/2/2018 12:51:41	11.7	9.40	104.3	7.87	44331	28.55
CLDS Reference	D	11	12/2/2018 12:52:03	11.5	9.42	104.0	7.86	44219	28.47
CLDS Reference	E	11	12/2/2018 12:52:23	11.7	9.30	103.1	7.85	44265	28.51
Composite 2	A	11	12/2/2018 12:52:39	11.7	9.28	102.9	7.86	44224	28.48
Composite 2	B	11	12/2/2018 12:53:01	12.0	9.29	103.7	7.87	44336	28.57
Composite 2	C	11	12/2/2018 12:53:48	12.0	9.18	102.4	7.86	44312	28.55
Composite 2	D	11	12/2/2018 12:54:08	12.0	9.15	102.0	7.86	44273	28.52
Composite 2	E	11	12/2/2018 12:54:30	11.8	8.95	99.4	7.83	44172	28.44
Composite 3	A	11	12/2/2018 12:54:54	11.8	9.02	100.2	7.83	44203	28.47
Composite 3	B	11	12/2/2018 12:55:13	12.0	9.18	102.4	7.85	44301	28.54
Composite 3	C	11	12/2/2018 12:55:33	11.8	9.05	100.6	7.85	44250	28.50
Composite 3	D	11	12/2/2018 12:55:58	11.5	9.13	100.8	7.84	44190	28.45
Composite 3	E	11	12/2/2018 12:56:14	11.6	9.09	100.6	7.83	44205	28.46
Composite 4	A	11	12/2/2018 12:56:29	11.7	9.16	101.7	7.84	44311	28.54
Composite 4	B	11	12/2/2018 12:56:47	11.5	9.10	100.4	7.83	44265	28.50
Composite 4	C	11	12/2/2018 12:57:03	11.6	9.16	101.6	7.84	44499	28.67
Composite 4	D	11	12/2/2018 12:57:22	11.4	9.34	103.0	7.86	44436	28.62
Composite 4	E	11	12/2/2018 12:59:12	11.9	9.08	101.0	7.85	44227	28.49
Composite 5	A	11	12/2/2018 12:59:37	11.5	9.25	102.6	7.91	45228	29.19
Composite 5	B	11	12/2/2018 13:00:02	11.7	9.04	100.2	7.87	44031	28.34
Composite 5	C	11	12/2/2018 13:00:26	11.9	9.19	102.4	7.88	44230	28.49
Composite 5	D	11	12/2/2018 13:00:48	11.7	8.88	98.4	7.84	44284	28.52
Composite 5	E	11	12/2/2018 13:01:15	11.7	9.29	103.1	7.88	44162	28.44
Composite 6	A	11	12/2/2018 13:01:52	11.7	8.92	98.9	7.85	44189	28.45
Composite 6	B	11	12/2/2018 13:02:16	11.8	9.15	101.7	7.86	44180	28.45
Composite 6	C	11	12/2/2018 13:02:42	11.8	9.12	101.3	7.86	44131	28.42
Composite 6	D	11	12/2/2018 13:03:07	11.8	9.16	101.9	7.86	44255	28.51
Composite 6	E	11	12/2/2018 13:03:32	11.7	9.19	101.9	7.86	44164	28.44
Laboratory Control	A	12	12/3/2018 11:57:59	12.0	8.08	92.2	7.69	46822	30.35
Laboratory Control	B	12	12/3/2018 11:58:20	11.6	8.45	95.7	7.67	47004	30.47
Laboratory Control	C	12	12/3/2018 11:58:43	11.4	8.94	100.9	7.73	47016	30.47
Laboratory Control	D	12	12/3/2018 11:58:48	11.4	8.97	101.2	7.73	47023	30.47
Laboratory Control	E	12	12/3/2018 11:59:09	11.3	8.66	97.5	7.71	47034	30.47
CLDS Reference	A	12	12/3/2018 11:59:35	11.3	9.16	103.0	7.79	47023	30.46
CLDS Reference	B	12	12/3/2018 11:59:55	11.3	9.22	103.6	7.81	46946	30.41
CLDS Reference	C	12	12/3/2018 12:00:32	11.6	8.87	100.3	7.83	46876	30.37

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
CLDS Reference	D	12	12/3/2018 12:01:00	11.5	9.07	102.5	7.83	46972	30.44
CLDS Reference	E	12	12/3/2018 12:01:24	11.7	8.89	100.8	7.82	46912	30.40
Composite 2	A	12	12/3/2018 12:02:05	11.7	9.02	102.4	7.84	47038	30.50
Composite 2	B	12	12/3/2018 12:02:50	12.1	7.94	90.8	7.82	46868	30.39
Composite 2	C	12	12/3/2018 12:03:08	12.1	8.18	93.6	7.83	46820	30.36
Composite 2	D	12	12/3/2018 12:03:23	11.8	8.18	93.0	7.80	46859	30.37
Composite 2	E	12	12/3/2018 12:04:38	11.8	8.15	92.6	7.80	46859	30.37
Composite 3	A	12	12/3/2018 12:05:01	11.5	8.88	100.4	7.81	46966	30.43
Composite 3	B	12	12/3/2018 12:05:26	11.7	8.58	97.2	7.82	46855	30.36
Composite 3	C	12	12/3/2018 12:05:51	11.5	8.44	95.2	7.80	46887	30.37
Composite 3	D	12	12/3/2018 12:06:06	11.6	8.45	95.6	7.80	46875	30.37
Composite 3	E	12	12/3/2018 12:06:21	11.8	8.55	96.5	7.82	45112	29.12
Composite 4	A	12	12/3/2018 12:06:32	11.8	8.46	96.2	7.83	46832	30.35
Composite 4	B	12	12/3/2018 12:06:55	11.6	8.30	94.0	7.80	47004	30.47
Composite 4	C	12	12/3/2018 12:07:10	11.7	8.18	92.8	7.80	47053	30.50
Composite 4	D	12	12/3/2018 12:07:34	11.5	8.99	101.5	7.83	47206	30.60
Composite 4	E	12	12/3/2018 12:08:42	12.1	8.26	94.4	7.83	46813	30.35
Composite 5	A	12	12/3/2018 12:09:07	11.7	8.92	101.7	7.91	47932	31.14
Composite 5	B	12	12/3/2018 12:09:35	11.8	8.63	97.9	7.85	46727	30.27
Composite 5	C	12	12/3/2018 12:09:59	12.0	8.74	99.6	7.86	46782	30.32
Composite 5	D	12	12/3/2018 12:10:24	11.8	8.11	92.1	7.83	46912	30.41
Composite 5	E	12	12/3/2018 12:10:47	11.8	8.92	101.3	7.86	46797	30.33
Composite 6	A	12	12/3/2018 12:11:14	11.7	8.21	93.1	7.83	46807	30.33
Composite 6	B	12	12/3/2018 12:11:39	11.9	8.58	97.6	7.85	46788	30.32
Composite 6	C	12	12/3/2018 12:11:54	11.9	8.57	97.6	7.85	46770	30.31
Composite 6	D	12	12/3/2018 12:12:19	12.0	8.44	96.2	7.85	46803	30.34
Composite 6	E	12	12/3/2018 12:12:40	11.8	8.61	97.7	7.85	46773	30.31
Laboratory Control	A	13	12/4/2018 09:45:54	11.9	7.81	87.6	7.62	46400	30.04
Laboratory Control	B	13	12/4/2018 09:46:16	11.6	8.17	91.0	7.63	46293	29.96
Laboratory Control	C	13	12/4/2018 09:46:32	11.4	8.31	92.1	7.62	46268	29.93
Laboratory Control	D	13	12/4/2018 09:46:54	11.2	8.87	98.0	7.70	46276	29.92
Laboratory Control	E	13	12/4/2018 09:47:17	11.1	8.64	95.3	7.69	46297	29.93
CLDS Reference	A	13	12/4/2018 09:47:38	11.1	9.01	99.3	7.75	46342	29.97
CLDS Reference	B	13	12/4/2018 09:48:12	11.1	9.02	99.3	7.79	46295	29.93
CLDS Reference	C	13	12/4/2018 09:48:35	11.4	8.89	98.7	7.79	46678	30.22
CLDS Reference	D	13	12/4/2018 09:48:59	11.3	8.95	99.0	7.80	46325	29.96
CLDS Reference	E	13	12/4/2018 09:49:22	11.4	8.84	98.1	7.79	46419	30.04
Composite 2	A	13	12/4/2018 09:49:42	11.6	8.79	98.0	7.81	46639	30.20
Composite 2	B	13	12/4/2018 09:49:59	11.6	8.86	98.6	7.82	46200	29.89
Composite 2	C	13	12/4/2018 09:50:58	11.6	7.26	80.8	7.75	46289	29.95
Composite 2	D	13	12/4/2018 09:51:23	11.5	8.42	93.5	7.78	46178	29.87
Composite 2	E	13	12/4/2018 09:51:57	11.4	7.58	84.0	7.74	46157	29.85
Composite 3	A	13	12/4/2018 09:52:15	11.3	7.64	84.4	7.73	46081	29.79

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 3	B	13	12/4/2018 09:52:48	11.1	8.81	97.2	7.80	46183	29.85
Composite 3	C	13	12/4/2018 09:53:13	11.1	8.45	93.1	7.78	46090	29.79
Composite 3	D	13	12/4/2018 09:53:38	11.1	7.88	86.8	7.75	46161	29.83
Composite 3	E	13	12/4/2018 09:53:58	11.1	8.10	89.2	7.74	46129	29.81
Composite 4	A	13	12/4/2018 09:54:23	11.1	8.25	90.9	7.76	46102	29.79
Composite 4	B	13	12/4/2018 09:54:48	11.2	7.78	85.9	7.73	46244	29.90
Composite 4	C	13	12/4/2018 09:55:12	11.2	7.10	78.5	7.70	46188	29.86
Composite 4	D	13	12/4/2018 09:55:40	11.2	8.88	98.3	7.78	46586	30.15
Composite 4	E	13	12/4/2018 09:56:20	11.5	8.13	90.2	7.76	46065	29.78
Composite 5	A	13	12/4/2018 09:56:45	11.4	8.82	98.2	7.90	47087	30.52
Composite 5	B	13	12/4/2018 09:57:14	11.4	8.62	95.6	7.84	45913	29.67
Composite 5	C	13	12/4/2018 09:57:36	11.5	8.78	97.6	7.87	46257	29.92
Composite 5	D	13	12/4/2018 09:58:05	11.4	7.74	85.9	7.81	46162	29.85
Composite 5	E	13	12/4/2018 09:58:30	11.4	8.88	98.4	7.86	46228	29.90
Composite 6	A	13	12/4/2018 09:59:01	11.3	7.75	85.7	7.78	46072	29.78
Composite 6	B	13	12/4/2018 09:59:30	11.4	8.58	95.2	7.80	46288	29.94
Composite 6	C	13	12/4/2018 09:59:54	11.4	8.33	92.4	7.79	46116	29.82
Composite 6	D	13	12/4/2018 10:00:19	11.5	8.34	92.8	7.79	46483	30.09
Composite 6	E	13	12/4/2018 10:00:41	11.4	8.64	95.9	7.80	46300	29.95
Laboratory Control	A	14	12/5/2018 09:57:01	12.1	8.22	91.8	7.68	46619	30.21
Laboratory Control	B	14	12/5/2018 09:57:29	11.9	8.48	94.4	7.69	46501	30.12
Laboratory Control	C	14	12/5/2018 09:57:42	11.5	8.58	94.2	7.68	45842	29.63
Laboratory Control	D	14	12/5/2018 09:58:02	11.2	8.97	97.8	7.71	45562	29.41
Laboratory Control	E	14	12/5/2018 09:58:22	11.1	8.75	95.2	7.70	45473	29.34
CLDS Reference	A	14	12/5/2018 09:59:02	11.1	9.11	99.3	7.76	45858	29.62
CLDS Reference	B	14	12/5/2018 09:59:40	11.2	9.09	99.4	7.78	46061	29.77
CLDS Reference	C	14	12/5/2018 10:00:05	11.8	8.86	98.5	7.79	46783	30.31
CLDS Reference	D	14	12/5/2018 10:00:29	11.4	8.91	97.9	7.79	46182	29.87
CLDS Reference	E	14	12/5/2018 10:00:55	11.7	8.77	97.1	7.78	46644	30.21
Composite 2	A	14	12/5/2018 10:01:18	11.9	8.73	97.1	7.80	46766	30.30
Composite 2	B	14	12/5/2018 10:01:42	11.6	8.88	98.1	7.80	46476	30.08
Composite 2	C	14	12/5/2018 10:02:45	11.7	7.83	86.6	7.76	46293	29.96
Composite 2	D	14	12/5/2018 10:03:09	11.7	8.52	94.3	7.79	46383	30.02
Composite 2	E	14	12/5/2018 10:03:31	11.4	7.94	87.0	7.76	45797	29.59
Composite 3	A	14	12/5/2018 10:03:50	11.3	8.02	87.8	7.76	45810	29.59
Composite 3	B	14	12/5/2018 10:04:14	11.1	8.85	96.1	7.79	45389	29.28
Composite 3	C	14	12/5/2018 10:04:40	11.1	8.39	91.0	7.77	45188	29.14
Composite 3	D	14	12/5/2018 10:05:04	11.2	8.57	93.7	7.78	46131	29.82
Composite 3	E	14	12/5/2018 10:05:28	11.1	8.60	93.6	7.79	45450	29.33
Composite 4	A	14	12/5/2018 10:05:54	11.1	8.60	93.4	7.77	45259	29.19
Composite 4	B	14	12/5/2018 10:06:15	11.1	8.27	90.2	7.75	45755	29.55
Composite 4	C	14	12/5/2018 10:06:35	11.2	8.07	88.0	7.73	45768	29.56
Composite 4	D	14	12/5/2018 10:06:59	11.2	8.94	97.7	7.78	46059	29.77

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	E	14	12/5/2018 10:07:35	11.3	8.19	89.4	7.75	45176	29.14
Composite 5	A	14	12/5/2018 10:08:00	11.3	8.87	97.1	7.88	46124	29.82
Composite 5	B	14	12/5/2018 10:08:19	11.4	8.73	95.3	7.85	44987	29.01
Composite 5	C	14	12/5/2018 10:08:44	11.7	8.72	96.5	7.85	46453	30.07
Composite 5	D	14	12/5/2018 10:09:06	11.5	8.08	88.7	7.82	45687	29.51
Composite 5	E	14	12/5/2018 10:09:31	11.5	8.86	97.7	7.84	46297	29.95
Composite 6	A	14	12/5/2018 10:10:11	11.6	8.25	91.1	7.78	46310	29.97
Composite 6	B	14	12/5/2018 10:10:38	11.8	8.62	95.6	7.80	46519	30.12
Composite 6	C	14	12/5/2018 10:11:03	11.7	8.60	95.2	7.80	46340	29.99
Composite 6	D	14	12/5/2018 10:11:26	11.8	8.64	96.0	7.81	46664	30.23
Composite 6	E	14	12/5/2018 10:11:52	11.6	8.66	95.7	7.80	46515	30.11
Laboratory Control	A	15	12/6/2018 09:59:23	11.9	7.99	89.5	7.66	47599	30.91
Laboratory Control	B	15	12/6/2018 09:59:50	11.8	8.34	93.2	7.69	47493	30.83
Laboratory Control	C	15	12/6/2018 10:00:22	11.4	8.42	93.0	7.66	47148	30.56
Laboratory Control	D	15	12/6/2018 10:00:45	11.1	8.98	98.5	7.69	46801	30.30
Laboratory Control	E	15	12/6/2018 10:01:06	11.4	8.55	94.6	7.70	47317	30.68
CLDS Reference	A	15	12/6/2018 10:01:31	11.1	8.99	98.7	7.73	47216	30.59
CLDS Reference	B	15	12/6/2018 10:02:06	11.1	9.06	99.6	7.76	47414	30.74
CLDS Reference	C	15	12/6/2018 10:02:29	11.7	8.84	98.3	7.78	47368	30.73
CLDS Reference	D	15	12/6/2018 10:02:49	11.3	8.87	97.9	7.77	47490	30.80
CLDS Reference	E	15	12/6/2018 10:03:16	11.5	8.74	97.0	7.77	47552	30.86
Composite 2	A	15	12/6/2018 10:03:40	11.7	8.75	97.5	7.79	47392	30.75
Composite 2	B	15	12/6/2018 10:03:57	11.5	8.88	98.6	7.78	47713	30.97
Composite 2	C	15	12/6/2018 10:04:24	11.6	8.57	95.2	7.78	47520	30.83
Composite 2	D	15	12/6/2018 10:04:58	11.6	8.53	94.7	7.79	47487	30.81
Composite 2	E	15	12/6/2018 10:05:20	11.4	8.25	91.1	7.78	47052	30.49
Composite 3	A	15	12/6/2018 10:05:38	11.2	8.11	89.2	7.76	47075	30.50
Composite 3	B	15	12/6/2018 10:05:58	11.0	8.80	96.2	7.78	46612	30.15
Composite 3	C	15	12/6/2018 10:06:21	11.0	8.34	91.1	7.77	46355	29.97
Composite 3	D	15	12/6/2018 10:06:44	11.2	8.51	93.7	7.78	47388	30.72
Composite 3	E	15	12/6/2018 10:07:05	11.1	8.52	93.5	7.79	46997	30.44
Composite 4	A	15	12/6/2018 10:07:26	11.0	8.59	93.9	7.77	46554	30.11
Composite 4	B	15	12/6/2018 10:07:38	11.0	8.51	93.3	7.76	47051	30.47
Composite 4	C	15	12/6/2018 10:08:00	11.1	8.17	89.7	7.74	47134	30.53
Composite 4	D	15	12/6/2018 10:08:26	11.1	8.95	98.3	7.76	47438	30.75
Composite 4	E	15	12/6/2018 10:08:57	11.3	8.12	89.2	7.74	46360	29.99
Composite 5	A	15	12/6/2018 10:09:25	11.2	8.87	97.7	7.87	47274	30.64
Composite 5	B	15	12/6/2018 10:09:46	11.3	8.57	94.1	7.85	46138	29.83
Composite 5	C	15	12/6/2018 10:10:11	11.4	8.76	97.0	7.85	47509	30.82
Composite 5	D	15	12/6/2018 10:10:30	11.4	8.15	90.0	7.83	46859	30.35
Composite 5	E	15	12/6/2018 10:10:54	11.4	8.83	97.7	7.83	47431	30.76
Composite 6	A	15	12/6/2018 10:11:18	11.2	8.05	88.7	7.78	47486	30.79
Composite 6	B	15	12/6/2018 10:11:34	11.6	8.33	92.6	7.79	47442	30.78

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	C	15	12/6/2018 10:11:52	11.5	8.50	94.2	7.79	47469	30.79
Composite 6	D	15	12/6/2018 10:12:15	11.6	8.59	95.4	7.80	47452	30.79
Composite 6	E	15	12/6/2018 10:12:36	11.3	8.48	93.7	7.78	47630	30.90
Laboratory Control	A	16	12/7/2018 09:55:19	11.9	8.86	97.7	7.14	44889	28.96
Laboratory Control	B	16	12/7/2018 09:55:40	11.8	9.12	100.4	7.30	44753	28.86
Laboratory Control	C	16	12/7/2018 09:55:57	11.7	9.12	100.0	7.36	44772	28.87
Laboratory Control	D	16	12/7/2018 09:56:13	11.8	9.31	102.2	7.45	44541	28.71
Laboratory Control	E	16	12/7/2018 09:56:36	11.4	9.18	100.1	7.49	44887	28.94
CLDS Reference	A	16	12/7/2018 09:56:58	11.3	9.45	102.8	7.57	44813	28.88
CLDS Reference	B	16	12/7/2018 09:57:16	11.4	9.45	103.0	7.61	44724	28.82
CLDS Reference	C	16	12/7/2018 09:57:33	11.6	9.38	102.6	7.63	44562	28.72
CLDS Reference	D	16	12/7/2018 09:57:51	11.5	9.33	102.0	7.65	44859	28.92
CLDS Reference	E	16	12/7/2018 09:58:07	11.5	9.29	101.6	7.65	45026	29.04
Composite 2	A	16	12/7/2018 09:58:28	11.7	9.21	101.0	7.68	44704	28.82
Composite 2	B	16	12/7/2018 09:58:39	11.8	9.25	101.6	7.69	44513	28.69
Composite 2	C	16	12/7/2018 09:59:00	12.0	9.21	101.5	7.70	44474	28.67
Composite 2	D	16	12/7/2018 09:59:13	11.9	9.09	100.0	7.71	44733	28.85
Composite 2	E	16	12/7/2018 09:59:33	12.0	9.16	101.0	7.72	44487	28.68
Composite 3	A	16	12/7/2018 09:59:47	12.0	9.19	101.3	7.73	44505	28.69
Composite 3	B	16	12/7/2018 10:00:08	11.9	9.18	101.0	7.74	44512	28.69
Composite 3	C	16	12/7/2018 10:00:24	11.8	9.14	100.4	7.74	44523	28.70
Composite 3	D	16	12/7/2018 10:00:50	11.8	9.13	100.3	7.75	44561	28.72
Composite 3	E	16	12/7/2018 10:01:10	11.6	9.00	98.5	7.75	44794	28.88
Composite 4	A	16	12/7/2018 10:01:26	11.7	9.15	100.2	7.76	44606	28.75
Composite 4	B	16	12/7/2018 10:01:43	11.5	9.09	99.4	7.75	44842	28.91
Composite 4	C	16	12/7/2018 10:02:05	11.5	8.97	98.0	7.74	44855	28.92
Composite 4	D	16	12/7/2018 10:02:30	11.3	9.26	101.0	7.76	45532	29.39
Composite 4	E	16	12/7/2018 10:03:03	11.9	9.04	99.5	7.77	44549	28.72
Composite 5	A	16	12/7/2018 10:03:17	11.7	9.13	100.3	7.83	45150	29.14
Composite 5	B	16	12/7/2018 10:03:30	12.1	9.09	100.3	7.82	44438	28.65
Composite 5	C	16	12/7/2018 10:03:48	11.9	9.11	100.3	7.82	44589	28.75
Composite 5	D	16	12/7/2018 10:04:08	11.7	8.41	92.4	7.80	45051	29.07
Composite 5	E	16	12/7/2018 10:04:28	11.8	9.16	100.7	7.82	44597	28.75
Composite 6	A	16	12/7/2018 10:04:57	11.9	9.18	101.0	7.80	44501	28.68
Composite 6	B	16	12/7/2018 10:05:11	11.7	9.09	99.9	7.79	44858	28.93
Composite 6	C	16	12/7/2018 10:05:32	11.7	9.09	99.8	7.79	44890	28.95
Composite 6	D	16	12/7/2018 10:05:45	11.7	9.01	98.9	7.79	45023	29.05
Composite 6	E	16	12/7/2018 10:06:05	11.7	9.04	99.1	7.79	44852	28.93
Laboratory Control	A	17	12/8/2018 09:52:16	12.0	8.62	94.1	7.72	44165	28.45
Laboratory Control	B	17	12/8/2018 09:52:34	11.9	8.91	97.1	7.74	44116	28.41
Laboratory Control	C	17	12/8/2018 09:53:05	11.8	8.89	96.6	7.73	44185	28.45
Laboratory Control	D	17	12/8/2018 09:53:29	11.9	9.19	100.0	7.77	44049	28.36

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	E	17	12/8/2018 09:53:50	11.6	9.04	97.9	7.76	44235	28.48
CLDS Reference	A	17	12/8/2018 09:54:13	11.5	9.21	99.5	7.79	44277	28.51
CLDS Reference	B	17	12/8/2018 09:54:31	11.6	9.31	100.7	7.80	44163	28.43
CLDS Reference	C	17	12/8/2018 09:54:53	11.8	9.19	99.9	7.81	44049	28.36
CLDS Reference	D	17	12/8/2018 09:55:07	11.7	9.23	100.0	7.81	44209	28.47
CLDS Reference	E	17	12/8/2018 09:55:29	11.7	9.15	99.3	7.81	44324	28.55
Composite 2	A	17	12/8/2018 09:55:49	11.8	9.13	99.2	7.82	44135	28.42
Composite 2	B	17	12/8/2018 09:56:10	12.0	9.22	100.6	7.82	44036	28.35
Composite 2	C	17	12/8/2018 09:56:47	12.0	9.15	99.8	7.82	44026	28.35
Composite 2	D	17	12/8/2018 09:57:03	11.9	9.07	98.8	7.83	44125	28.42
Composite 2	E	17	12/8/2018 09:57:25	12.0	9.14	99.8	7.83	44017	28.34
Composite 3	A	17	12/8/2018 09:57:39	12.0	9.19	100.3	7.83	44009	28.34
Composite 3	B	17	12/8/2018 09:58:01	11.9	9.15	99.7	7.83	44044	28.36
Composite 3	C	17	12/8/2018 09:58:20	11.9	9.09	99.0	7.83	44018	28.34
Composite 3	D	17	12/8/2018 09:58:43	11.9	9.09	98.8	7.84	44044	28.36
Composite 3	E	17	12/8/2018 09:59:06	11.6	8.94	96.9	7.83	44210	28.46
Composite 4	A	17	12/8/2018 09:59:19	11.7	9.08	98.5	7.83	44079	28.38
Composite 4	B	17	12/8/2018 09:59:33	11.5	8.97	96.9	7.82	44339	28.55
Composite 4	C	17	12/8/2018 09:59:54	11.6	8.85	95.7	7.81	44209	28.46
Composite 4	D	17	12/8/2018 10:00:07	11.5	9.13	98.7	7.82	44458	28.64
Composite 4	E	17	12/8/2018 10:00:58	11.9	9.07	98.8	7.83	44053	28.36
Composite 5	A	17	12/8/2018 10:01:17	11.7	8.92	97.1	7.88	44756	28.86
Composite 5	B	17	12/8/2018 10:01:34	12.1	9.04	98.8	7.87	43993	28.33
Composite 5	C	17	12/8/2018 10:01:55	11.9	9.10	99.1	7.88	44083	28.39
Composite 5	D	17	12/8/2018 10:02:14	11.7	8.39	91.1	7.86	44675	28.80
Composite 5	E	17	12/8/2018 10:02:35	11.8	9.11	98.9	7.87	44108	28.40
Composite 6	A	17	12/8/2018 10:03:00	12.0	9.12	99.4	7.85	44014	28.34
Composite 6	B	17	12/8/2018 10:03:18	11.7	8.55	92.8	7.81	44419	28.62
Composite 6	C	17	12/8/2018 10:03:39	11.8	8.95	97.2	7.83	44249	28.50
Composite 6	D	17	12/8/2018 10:04:00	11.9	9.18	99.9	7.83	44070	28.38
Composite 6	E	17	12/8/2018 10:04:14	11.7	9.04	98.2	7.83	44201	28.46
Laboratory Control	A	18	12/9/2018 12:36:47	12.1	8.71	95.6	7.63	43489	27.97
Laboratory Control	B	18	12/9/2018 12:37:02	12.0	8.74	95.5	7.63	43444	27.93
Laboratory Control	C	18	12/9/2018 12:37:24	11.8	9.00	98.1	7.64	43460	27.94
Laboratory Control	D	18	12/9/2018 12:37:45	11.9	9.37	102.4	7.70	43654	28.08
Laboratory Control	E	18	12/9/2018 12:38:03	11.7	9.26	100.6	7.70	43581	28.02
CLDS Reference	A	18	12/9/2018 12:38:19	11.5	9.42	102.1	7.73	43563	28.00
CLDS Reference	B	18	12/9/2018 12:38:50	11.6	9.31	101.0	7.76	43599	28.03
CLDS Reference	C	18	12/9/2018 12:39:11	11.8	9.44	103.1	7.77	43676	28.09
CLDS Reference	D	18	12/9/2018 12:39:27	11.7	9.34	101.5	7.76	43524	27.98
CLDS Reference	E	18	12/9/2018 12:39:49	11.8	9.34	101.8	7.76	43572	28.02
Composite 2	A	18	12/9/2018 12:40:09	11.9	9.20	100.6	7.77	43615	28.05
Composite 2	B	18	12/9/2018 12:40:27	12.0	9.33	102.2	7.78	43700	28.12

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	C	18	12/9/2018 12:42:15	12.1	9.34	102.5	7.80	43694	28.12
Composite 2	D	18	12/9/2018 12:42:37	12.0	9.15	100.2	7.80	43613	28.06
Composite 2	E	18	12/9/2018 12:42:58	12.1	9.26	101.7	7.80	43657	28.09
Composite 3	A	18	12/9/2018 12:43:19	12.1	9.34	102.6	7.81	43671	28.10
Composite 3	B	18	12/9/2018 12:43:35	12.0	9.26	101.4	7.81	43649	28.08
Composite 3	C	18	12/9/2018 12:44:03	12.0	9.22	100.9	7.82	43646	28.08
Composite 3	D	18	12/9/2018 12:44:23	11.9	9.27	101.4	7.82	43663	28.09
Composite 3	E	18	12/9/2018 12:44:42	11.7	8.96	97.3	7.81	43481	27.95
Composite 4	A	18	12/9/2018 12:45:47	11.8	9.13	99.5	7.81	43596	28.03
Composite 4	B	18	12/9/2018 12:46:08	11.6	8.95	97.2	7.79	43527	27.98
Composite 4	C	18	12/9/2018 12:46:21	11.7	8.89	96.7	7.78	43543	27.99
Composite 4	D	18	12/9/2018 12:46:38	11.6	9.27	100.7	7.80	43696	28.10
Composite 4	E	18	12/9/2018 12:47:31	12.0	9.05	98.9	7.80	43585	28.03
Composite 5	A	18	12/9/2018 12:48:12	11.8	8.59	93.8	7.87	43815	28.19
Composite 5	B	18	12/9/2018 12:48:35	12.2	9.25	101.6	7.85	43660	28.10
Composite 5	C	18	12/9/2018 12:48:56	12.0	9.11	99.7	7.86	43498	27.97
Composite 5	D	18	12/9/2018 12:49:19	11.8	8.39	91.5	7.84	43736	28.14
Composite 5	E	18	12/9/2018 12:49:40	11.9	9.22	100.8	7.85	43558	28.01
Composite 6	A	18	12/9/2018 12:50:05	12.0	9.21	100.9	7.83	43623	28.06
Composite 6	B	18	12/9/2018 12:50:28	11.7	8.82	95.9	7.80	43493	27.96
Composite 6	C	18	12/9/2018 12:50:47	11.8	9.09	99.1	7.81	43437	27.92
Composite 6	D	18	12/9/2018 12:51:04	12.0	9.20	100.8	7.82	43792	28.18
Composite 6	E	18	12/9/2018 12:51:25	11.8	9.04	98.4	7.80	43432	27.92
Laboratory Control	A	19	12/10/2018 11:05:29	12.0	8.78	96.5	7.73	42893	27.54
Laboratory Control	B	19	12/10/2018 11:05:49	11.7	8.73	95.3	7.71	42770	27.45
Laboratory Control	C	19	12/10/2018 11:06:04	11.6	9.00	98.0	7.71	42793	27.46
Laboratory Control	D	19	12/10/2018 11:06:21	11.8	9.32	101.8	7.75	42790	27.46
Laboratory Control	E	19	12/10/2018 11:06:43	11.5	9.18	99.7	7.75	42932	27.55
CLDS Reference	A	19	12/10/2018 11:06:59	11.3	9.40	101.6	7.78	42921	27.54
CLDS Reference	B	19	12/10/2018 11:07:30	11.3	9.34	101.1	7.80	42971	27.57
CLDS Reference	C	19	12/10/2018 11:07:53	11.7	9.36	102.2	7.81	42986	27.60
CLDS Reference	D	19	12/10/2018 11:08:15	11.4	9.36	101.4	7.81	42886	27.52
CLDS Reference	E	19	12/10/2018 11:08:32	11.5	9.31	101.1	7.81	42934	27.55
Composite 2	A	19	12/10/2018 11:08:48	11.7	9.20	100.4	7.82	42873	27.52
Composite 2	B	19	12/10/2018 11:09:13	11.9	9.25	101.4	7.82	42989	27.61
Composite 2	C	19	12/10/2018 11:09:54	12.1	9.07	99.8	7.82	42962	27.60
Composite 2	D	19	12/10/2018 11:10:06	11.9	9.15	100.2	7.82	42929	27.56
Composite 2	E	19	12/10/2018 11:10:16	12.0	9.13	100.2	7.82	42934	27.57
Composite 3	A	19	12/10/2018 11:10:30	12.1	9.24	101.7	7.82	42941	27.58
Composite 3	B	19	12/10/2018 11:10:49	11.9	9.20	100.8	7.83	42946	27.58
Composite 3	C	19	12/10/2018 11:11:04	11.9	9.21	100.9	7.83	42945	27.58
Composite 3	D	19	12/10/2018 11:11:28	11.8	9.26	101.4	7.83	42971	27.59
Composite 3	E	19	12/10/2018 11:11:52	11.4	8.98	97.4	7.83	42823	27.47

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	19	12/10/2018 11:12:13	11.5	9.13	99.1	7.83	42931	27.55
Composite 4	B	19	12/10/2018 11:12:30	11.4	9.03	97.9	7.82	42880	27.51
Composite 4	C	19	12/10/2018 11:12:46	11.4	8.88	96.3	7.80	42907	27.53
Composite 4	D	19	12/10/2018 11:13:03	11.4	9.29	100.8	7.82	43045	27.63
Composite 4	E	19	12/10/2018 11:13:47	11.8	9.04	98.8	7.82	42970	27.59
Composite 5	A	19	12/10/2018 11:14:02	11.6	8.92	97.2	7.87	42919	27.55
Composite 5	B	19	12/10/2018 11:14:22	12.2	9.16	101.0	7.85	42924	27.57
Composite 5	C	19	12/10/2018 11:14:39	11.9	9.10	99.6	7.86	42873	27.52
Composite 5	D	19	12/10/2018 11:14:55	11.7	8.46	92.2	7.84	42815	27.47
Composite 5	E	19	12/10/2018 11:15:16	11.8	9.22	100.9	7.84	42915	27.55
Composite 6	A	19	12/10/2018 11:15:37	11.9	9.11	99.7	7.83	42929	27.56
Composite 6	B	19	12/10/2018 11:15:59	11.5	8.82	95.7	7.81	42591	27.31
Composite 6	C	19	12/10/2018 11:16:27	11.6	8.85	96.2	7.81	42657	27.36
Composite 6	D	19	12/10/2018 11:16:44	11.8	9.13	99.9	7.82	42994	27.61
Composite 6	E	19	12/10/2018 11:17:07	11.6	9.03	98.2	7.81	42757	27.43
Laboratory Control	A	20	12/11/2018 09:14:01	12.1	8.89	99.1	7.75	46219	29.92
Laboratory Control	B	20	12/11/2018 09:14:13	11.8	8.83	97.7	7.73	46332	29.99
Laboratory Control	C	20	12/11/2018 09:14:35	11.6	8.98	98.9	7.73	46383	30.02
Laboratory Control	D	20	12/11/2018 09:14:49	11.4	9.28	102.0	7.75	46547	30.13
Laboratory Control	E	20	12/11/2018 09:15:03	11.5	9.20	101.1	7.75	46400	30.02
CLDS Reference	A	20	12/11/2018 09:15:24	11.3	9.38	102.8	7.78	46476	30.07
CLDS Reference	B	20	12/11/2018 09:15:58	11.4	9.35	102.6	7.79	46450	30.06
CLDS Reference	C	20	12/11/2018 09:16:19	11.8	9.34	103.2	7.81	46131	29.85
CLDS Reference	D	20	12/11/2018 09:16:40	11.5	9.31	102.4	7.80	46554	30.14
CLDS Reference	E	20	12/11/2018 09:17:02	11.5	9.27	102.0	7.80	46582	30.15
Composite 2	A	20	12/11/2018 09:17:24	11.7	9.15	101.2	7.81	46345	30.00
Composite 2	B	20	12/11/2018 09:17:39	11.9	9.18	101.7	7.81	46191	29.89
Composite 2	C	20	12/11/2018 09:22:40	12.2	9.23	103.0	7.83	46026	29.79
Composite 2	D	20	12/11/2018 09:22:48	12.0	9.24	102.7	7.83	46187	29.90
Composite 2	E	20	12/11/2018 09:23:03	12.1	9.15	101.8	7.83	46103	29.84
Composite 3	A	20	12/11/2018 09:23:15	12.2	9.21	102.7	7.83	46032	29.79
Composite 3	B	20	12/11/2018 09:23:36	12.0	9.18	101.9	7.83	46128	29.85
Composite 3	C	20	12/11/2018 09:24:01	11.9	9.13	101.3	7.84	46155	29.87
Composite 3	D	20	12/11/2018 09:24:23	11.9	9.20	102.0	7.84	46116	29.84
Composite 3	E	20	12/11/2018 09:24:44	11.4	8.93	98.0	7.84	46414	30.03
Composite 4	A	20	12/11/2018 09:25:04	11.5	9.06	99.6	7.84	46372	30.00
Composite 4	B	20	12/11/2018 09:25:19	11.4	8.97	98.5	7.83	46546	30.12
Composite 4	C	20	12/11/2018 09:25:36	11.4	8.90	97.7	7.82	46447	30.05
Composite 4	D	20	12/11/2018 09:25:55	11.4	9.27	101.9	7.82	46464	30.07
Composite 4	E	20	12/11/2018 09:27:36	11.8	8.96	99.2	7.82	46372	30.02
Composite 5	A	20	12/11/2018 09:27:55	11.6	8.85	97.8	7.89	46623	30.19
Composite 5	B	20	12/11/2018 09:28:15	12.3	9.10	101.6	7.87	46008	29.78
Composite 5	C	20	12/11/2018 09:28:35	11.9	9.08	100.7	7.87	46263	29.95

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	D	20	12/11/2018 09:28:57	11.6	8.36	92.3	7.85	46391	30.03
Composite 5	E	20	12/11/2018 09:29:16	11.8	9.13	101.1	7.84	46229	29.92
Composite 6	A	20	12/11/2018 09:29:38	11.8	9.12	101.0	7.84	46183	29.89
Composite 6	B	20	12/11/2018 09:29:58	11.4	8.73	95.8	7.82	46180	29.86
Composite 6	C	20	12/11/2018 09:30:20	11.4	8.60	94.4	7.80	46241	29.91
Composite 6	D	20	12/11/2018 09:30:39	11.7	9.05	99.9	7.82	46292	29.96
Composite 6	E	20	12/11/2018 09:30:59	11.5	8.97	98.6	7.81	46353	29.99
Laboratory Control	A	21	12/12/2018 10:09:39	11.9	9.07	101.2	7.69	46305	29.98
Laboratory Control	B	21	12/12/2018 10:10:01	11.7	9.22	102.5	7.71	46449	30.07
Laboratory Control	C	21	12/12/2018 10:10:19	11.5	9.25	102.4	7.71	46587	30.16
Laboratory Control	D	21	12/12/2018 10:10:37	11.3	9.49	104.7	7.73	46844	30.33
Laboratory Control	E	21	12/12/2018 10:10:57	11.4	9.36	103.2	7.74	46428	30.04
CLDS Reference	A	21	12/12/2018 10:11:14	11.2	9.58	105.5	7.76	46607	30.16
CLDS Reference	B	21	12/12/2018 10:11:49	11.3	9.55	105.3	7.78	46425	30.04
CLDS Reference	C	21	12/12/2018 10:12:02	11.7	9.46	104.8	7.80	46062	29.79
CLDS Reference	D	21	12/12/2018 10:12:24	11.3	9.50	104.9	7.79	46641	30.19
CLDS Reference	E	21	12/12/2018 10:12:44	11.4	9.35	103.5	7.79	47152	30.56
Composite 2	A	21	12/12/2018 10:13:06	11.7	9.30	103.2	7.81	46277	29.95
Composite 2	B	21	12/12/2018 10:13:16	11.8	9.33	103.7	7.81	46101	29.82
Composite 2	C	21	12/12/2018 10:13:57	12.1	9.32	104.2	7.82	45986	29.75
Composite 2	D	21	12/12/2018 10:14:12	11.9	9.23	102.9	7.81	46170	29.88
Composite 2	E	21	12/12/2018 10:14:32	12.0	9.20	102.7	7.82	46021	29.78
Composite 3	A	21	12/12/2018 10:14:53	12.1	9.31	104.1	7.82	45991	29.76
Composite 3	B	21	12/12/2018 10:15:09	11.9	9.30	103.6	7.82	46052	29.79
Composite 3	C	21	12/12/2018 10:15:35	11.9	9.12	101.6	7.83	46018	29.77
Composite 3	D	21	12/12/2018 10:15:57	11.8	9.28	103.2	7.83	46078	29.81
Composite 3	E	21	12/12/2018 10:16:14	11.3	9.04	99.7	7.82	46709	30.24
Composite 4	A	21	12/12/2018 10:16:35	11.5	9.26	102.4	7.83	46278	29.94
Composite 4	B	21	12/12/2018 10:16:54	11.4	9.18	101.3	7.82	46583	30.15
Composite 4	C	21	12/12/2018 10:17:16	11.3	9.21	101.6	7.82	46621	30.18
Composite 4	D	21	12/12/2018 10:17:39	11.3	9.40	103.6	7.82	46562	30.13
Composite 4	E	21	12/12/2018 10:18:27	11.7	9.01	100.1	7.82	46333	29.99
Composite 5	A	21	12/12/2018 10:18:48	11.6	8.93	99.3	7.90	47144	30.57
Composite 5	B	21	12/12/2018 10:19:07	12.2	9.23	103.2	7.87	45607	29.49
Composite 5	C	21	12/12/2018 10:19:28	11.9	9.13	101.7	7.86	46217	29.91
Composite 5	D	21	12/12/2018 10:19:50	11.6	8.34	92.6	7.82	46890	30.38
Composite 5	E	21	12/12/2018 10:20:12	11.6	9.26	102.7	7.84	46274	29.94
Composite 6	A	21	12/12/2018 10:20:34	11.7	9.18	102.0	7.83	46101	29.82
Composite 6	B	21	12/12/2018 10:20:56	11.4	8.74	96.6	7.81	46738	30.26
Composite 6	C	21	12/12/2018 10:21:13	11.4	8.46	93.4	7.79	46784	30.29
Composite 6	D	21	12/12/2018 10:21:32	11.5	9.17	101.5	7.81	46379	30.01
Composite 6	E	21	12/12/2018 10:21:53	11.4	9.01	99.6	7.80	46699	30.23

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	22	12/13/2018 08:45:59	12.1	8.72	95.9	7.55	46081	29.82
Laboratory Control	B	22	12/13/2018 08:46:22	11.9	9.03	99.0	7.59	46053	29.80
Laboratory Control	C	22	12/13/2018 08:46:37	11.7	9.06	99.0	7.60	46262	29.94
Laboratory Control	D	22	12/13/2018 08:46:51	11.6	9.25	100.8	7.61	46629	30.19
Laboratory Control	E	22	12/13/2018 08:47:15	11.7	9.19	100.2	7.64	46027	29.77
CLDS Reference	A	22	12/13/2018 08:47:29	11.6	9.33	101.7	7.65	46239	29.92
CLDS Reference	B	22	12/13/2018 08:48:00	11.6	9.34	101.7	7.68	46019	29.76
CLDS Reference	C	22	12/13/2018 08:48:20	12.0	9.35	102.3	7.70	45609	29.48
CLDS Reference	D	22	12/13/2018 08:48:34	11.6	9.33	101.7	7.69	46480	30.09
CLDS Reference	E	22	12/13/2018 08:48:53	11.6	9.22	100.9	7.69	47335	30.70
Composite 2	A	22	12/13/2018 08:49:06	11.9	9.20	100.6	7.71	45888	29.68
Composite 2	B	22	12/13/2018 08:49:29	12.1	9.20	101.1	7.71	45684	29.54
Composite 2	C	22	12/13/2018 08:50:05	12.2	9.23	101.5	7.71	45538	29.44
Composite 2	D	22	12/13/2018 08:50:17	11.9	9.06	99.1	7.70	45899	29.68
Composite 2	E	22	12/13/2018 08:50:28	12.2	9.07	99.7	7.71	45567	29.46
Composite 3	A	22	12/13/2018 08:50:50	12.2	9.26	101.9	7.72	45545	29.44
Composite 3	B	22	12/13/2018 08:51:09	12.1	9.17	100.6	7.72	45594	29.47
Composite 3	C	22	12/13/2018 08:51:24	12.0	9.18	100.6	7.73	45585	29.47
Composite 3	D	22	12/13/2018 08:51:46	12.0	9.21	100.8	7.73	45559	29.44
Composite 3	E	22	12/13/2018 08:52:07	11.5	8.87	96.4	7.73	46410	30.03
Composite 4	A	22	12/13/2018 08:52:29	11.7	9.18	100.0	7.74	45765	29.58
Composite 4	B	22	12/13/2018 08:52:44	11.5	9.13	99.1	7.73	46154	29.85
Composite 4	C	22	12/13/2018 08:53:02	11.4	9.39	101.9	7.74	46257	29.92
Composite 4	D	22	12/13/2018 08:53:16	11.7	9.22	100.5	7.74	46087	29.81
Composite 4	E	22	12/13/2018 08:54:05	11.8	8.95	97.8	7.74	45912	29.69
Composite 5	A	22	12/13/2018 08:54:27	11.7	8.86	97.0	7.83	47239	30.64
Composite 5	B	22	12/13/2018 08:54:53	12.3	9.18	101.1	7.78	45485	29.40
Composite 5	C	22	12/13/2018 08:55:15	11.9	9.11	99.7	7.78	45805	29.62
Composite 5	D	22	12/13/2018 08:55:39	11.6	7.91	86.4	7.72	46941	30.42
Composite 5	E	22	12/13/2018 08:56:02	11.6	9.17	99.7	7.75	46054	29.78
Composite 6	A	22	12/13/2018 08:56:24	11.7	9.09	99.0	7.75	45798	29.60
Composite 6	B	22	12/13/2018 08:56:45	11.4	8.65	94.0	7.73	46804	30.31
Composite 6	C	22	12/13/2018 08:57:08	11.4	8.28	90.0	7.70	46847	30.34
Composite 6	D	22	12/13/2018 08:57:30	11.6	9.15	99.5	7.74	45824	29.62
Composite 6	E	22	12/13/2018 08:57:51	11.4	8.92	97.0	7.72	46633	30.19
Laboratory Control	A	23	12/14/2018 11:47:02	12.0	8.83	97.2	7.57	46117	29.85
Laboratory Control	B	23	12/14/2018 11:47:23	11.7	9.02	98.8	7.59	46421	30.05
Laboratory Control	C	23	12/14/2018 11:47:44	11.5	9.05	98.8	7.58	46696	30.24
Laboratory Control	D	23	12/14/2018 11:48:05	11.3	9.31	101.4	7.61	47160	30.56
Laboratory Control	E	23	12/14/2018 11:48:25	11.3	9.25	100.4	7.63	46445	30.05
CLDS Reference	A	23	12/14/2018 11:48:45	11.2	9.42	102.1	7.66	46619	30.17
CLDS Reference	B	23	12/14/2018 11:49:07	11.3	9.43	102.3	7.69	46380	30.00
CLDS Reference	C	23	12/14/2018 11:49:19	11.6	9.38	102.2	7.69	46052	29.78

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
CLDS Reference	D	23	12/14/2018 11:49:40	11.3	9.29	101.1	7.69	47254	30.63
CLDS Reference	E	23	12/14/2018 11:49:57	11.4	9.24	101.2	7.68	48180	31.30
Composite 2	A	23	12/14/2018 11:50:20	11.6	9.22	100.7	7.71	46250	29.92
Composite 2	B	23	12/14/2018 11:50:41	11.8	9.26	101.3	7.71	46045	29.78
Composite 2	C	23	12/14/2018 11:51:27	12.0	9.20	101.1	7.71	45972	29.74
Composite 2	D	23	12/14/2018 11:51:51	11.8	8.99	98.6	7.70	46319	29.98
Composite 2	E	23	12/14/2018 11:52:04	12.0	9.06	99.6	7.70	45980	29.75
Composite 3	A	23	12/14/2018 11:52:19	12.0	9.24	101.6	7.71	45954	29.73
Composite 3	B	23	12/14/2018 11:52:40	11.8	9.20	100.8	7.72	46020	29.77
Composite 3	C	23	12/14/2018 11:53:01	11.8	9.18	100.7	7.73	45985	29.74
Composite 3	D	23	12/14/2018 11:53:23	11.7	9.18	100.3	7.73	46018	29.76
Composite 3	E	23	12/14/2018 11:53:46	11.3	8.88	96.6	7.72	46890	30.37
Composite 4	A	23	12/14/2018 11:54:10	11.5	9.20	100.2	7.73	46125	29.83
Composite 4	B	23	12/14/2018 11:54:28	11.4	9.07	98.6	7.72	46512	30.10
Composite 4	C	23	12/14/2018 11:54:48	11.3	7.93	86.3	7.67	46764	30.28
Composite 4	D	23	12/14/2018 11:55:01	11.4	8.86	96.3	7.70	46389	30.01
Composite 4	E	23	12/14/2018 11:55:27	11.7	8.93	97.6	7.71	46303	29.96
Composite 5	A	23	12/14/2018 11:55:49	11.6	8.87	97.7	7.82	47997	31.18
Composite 5	B	23	12/14/2018 11:56:04	12.1	9.03	99.4	7.80	45940	29.72
Composite 5	C	23	12/14/2018 11:56:21	11.8	9.10	99.6	7.79	46177	29.88
Composite 5	D	23	12/14/2018 11:56:40	11.6	8.48	93.2	7.72	47375	30.73
Composite 5	E	23	12/14/2018 11:56:56	11.5	9.13	99.6	7.74	46439	30.06
Composite 6	A	23	12/14/2018 11:57:23	11.6	9.15	99.9	7.75	46127	29.83
Composite 6	B	23	12/14/2018 11:57:45	11.4	8.71	95.2	7.72	47575	30.87
Composite 6	C	23	12/14/2018 11:57:54	11.4	8.71	95.2	7.71	47516	30.82
Composite 6	D	23	12/14/2018 11:58:10	11.5	9.10	99.2	7.73	46179	29.87
Composite 6	E	23	12/14/2018 11:58:31	11.4	8.98	98.1	7.71	47247	30.63
Laboratory Control	A	24	12/15/2018 11:43:08	11.8	8.99	98.9	7.67	44630	28.77
Laboratory Control	B	24	12/15/2018 11:44:07	11.7	9.06	99.5	7.71	44637	28.77
Laboratory Control	C	24	12/15/2018 11:44:23	11.6	9.24	101.3	7.71	44666	28.79
Laboratory Control	D	24	12/15/2018 11:44:40	11.5	9.36	102.4	7.73	44740	28.84
Laboratory Control	E	24	12/15/2018 11:45:02	11.4	9.22	100.6	7.73	44736	28.83
CLDS Reference	A	24	12/15/2018 11:45:20	11.4	9.22	100.5	7.75	44748	28.84
CLDS Reference	B	24	12/15/2018 11:45:34	11.4	9.40	102.5	7.76	44675	28.79
CLDS Reference	C	24	12/15/2018 11:45:55	11.5	9.44	103.1	7.77	44652	28.77
CLDS Reference	D	24	12/15/2018 11:46:17	11.4	9.40	102.7	7.78	44980	29.01
CLDS Reference	E	24	12/15/2018 11:46:31	11.5	9.40	102.9	7.78	44925	28.97
Composite 2	A	24	12/15/2018 11:46:47	11.6	9.17	100.5	7.78	44869	28.93
Composite 2	B	24	12/15/2018 11:47:06	11.7	9.27	101.7	7.78	44630	28.77
Composite 2	C	24	12/15/2018 11:47:30	11.7	9.22	101.2	7.77	44592	28.74
Composite 2	D	24	12/15/2018 11:47:46	11.6	9.11	99.9	7.77	44782	28.87
Composite 2	E	24	12/15/2018 11:48:07	11.6	9.11	99.9	7.76	44642	28.77
Composite 3	A	24	12/15/2018 11:48:22	11.7	9.18	100.8	7.77	44588	28.74

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 3	B	24	12/15/2018 11:48:47	11.5	9.21	100.8	7.78	44694	28.81
Composite 3	C	24	12/15/2018 11:49:01	11.6	9.14	100.0	7.78	44645	28.77
Composite 3	D	24	12/15/2018 11:49:23	11.5	9.08	99.2	7.77	44654	28.78
Composite 3	E	24	12/15/2018 11:49:40	11.4	8.99	98.1	7.77	44971	29.00
Composite 4	A	24	12/15/2018 11:49:57	11.4	9.14	99.9	7.77	44735	28.83
Composite 4	B	24	12/15/2018 11:50:10	11.4	9.15	100.0	7.77	44894	28.95
Composite 4	C	24	12/15/2018 11:50:22	11.5	9.14	99.9	7.77	44701	28.81
Composite 4	D	24	12/15/2018 11:50:39	11.4	9.22	100.7	7.78	44980	29.00
Composite 4	E	24	12/15/2018 11:51:05	11.6	9.03	99.0	7.77	44772	28.87
Composite 5	A	24	12/15/2018 11:51:26	11.7	9.04	99.2	7.80	44856	28.93
Composite 5	B	24	12/15/2018 11:51:40	11.7	9.18	100.9	7.80	44578	28.73
Composite 5	C	24	12/15/2018 11:51:56	11.8	9.09	99.8	7.80	44589	28.74
Composite 5	D	24	12/15/2018 11:52:19	11.9	9.35	103.1	7.79	44445	28.65
Composite 5	E	24	12/15/2018 11:52:40	11.6	9.19	100.7	7.79	44710	28.82
Composite 6	A	24	12/15/2018 11:53:07	11.6	9.10	99.6	7.79	44679	28.80
Composite 6	B	24	12/15/2018 11:53:21	11.6	9.16	100.4	7.79	44823	28.90
Composite 6	C	24	12/15/2018 11:53:36	11.6	9.21	101.0	7.79	44750	28.85
Composite 6	D	24	12/15/2018 11:53:53	11.7	9.20	100.9	7.79	44622	28.76
Composite 6	E	24	12/15/2018 11:54:15	11.7	9.27	101.8	7.79	44567	28.72
Laboratory Control	A	25	12/16/2018 12:15:48	11.9	8.78	96.8	7.66	44077	28.38
Laboratory Control	B	25	12/16/2018 12:16:17	11.8	9.13	100.6	7.69	44332	28.56
Laboratory Control	C	25	12/16/2018 12:16:38	11.7	9.13	100.2	7.69	44351	28.57
Laboratory Control	D	25	12/16/2018 12:17:00	11.5	9.35	102.3	7.72	44390	28.59
Laboratory Control	E	25	12/16/2018 12:17:29	11.4	9.34	101.7	7.72	43600	28.02
CLDS Reference	A	25	12/16/2018 12:17:49	11.4	9.44	103.0	7.75	44423	28.61
CLDS Reference	B	25	12/16/2018 12:18:12	11.3	9.46	103.1	7.77	44391	28.58
CLDS Reference	C	25	12/16/2018 12:18:49	11.5	9.44	103.2	7.78	44356	28.56
CLDS Reference	D	25	12/16/2018 12:19:10	11.5	9.42	103.1	7.78	44502	28.67
CLDS Reference	E	25	12/16/2018 12:19:26	11.6	9.33	102.3	7.77	44505	28.67
Composite 2	A	25	12/16/2018 12:19:47	11.6	9.20	101.0	7.77	44727	28.83
Composite 2	B	25	12/16/2018 12:20:12	11.7	9.25	101.7	7.78	44333	28.56
Composite 2	C	25	12/16/2018 12:21:07	11.8	9.15	100.6	7.78	44329	28.56
Composite 2	D	25	12/16/2018 12:21:28	11.7	9.01	99.1	7.75	44488	28.67
Composite 2	E	25	12/16/2018 12:21:50	11.7	9.05	99.5	7.76	44327	28.55
Composite 3	A	25	12/16/2018 12:22:11	11.8	9.05	99.5	7.76	44319	28.55
Composite 3	B	25	12/16/2018 12:22:33	11.6	9.21	101.1	7.78	44364	28.58
Composite 3	C	25	12/16/2018 12:22:54	11.6	9.12	100.0	7.78	44322	28.55
Composite 3	D	25	12/16/2018 12:23:15	11.5	9.06	99.1	7.77	44393	28.59
Composite 3	E	25	12/16/2018 12:23:30	11.4	9.00	98.5	7.76	44671	28.78
Composite 4	A	25	12/16/2018 12:23:48	11.5	9.10	99.5	7.77	44429	28.62
Composite 4	B	25	12/16/2018 12:24:09	11.5	9.12	99.8	7.76	44468	28.64
Composite 4	C	25	12/16/2018 12:24:31	11.5	9.17	100.4	7.77	44421	28.61
Composite 4	D	25	12/16/2018 12:24:50	11.4	9.25	101.1	7.77	44701	28.81

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	E	25	12/16/2018 12:25:48	11.7	8.93	98.1	7.76	44487	28.67
Composite 5	A	25	12/16/2018 12:26:14	11.7	9.08	100.0	7.80	44451	28.64
Composite 5	B	25	12/16/2018 12:26:35	11.8	9.16	100.8	7.80	44307	28.54
Composite 5	C	25	12/16/2018 12:27:01	11.8	9.11	100.4	7.81	44394	28.61
Composite 5	D	25	12/16/2018 12:27:21	11.8	9.25	102.0	7.80	44423	28.63
Composite 5	E	25	12/16/2018 12:27:45	11.7	9.19	101.0	7.80	44373	28.59
Composite 6	A	25	12/16/2018 12:28:12	11.7	9.09	99.9	7.79	44339	28.56
Composite 6	B	25	12/16/2018 12:28:41	11.7	9.15	100.7	7.79	44400	28.60
Composite 6	C	25	12/16/2018 12:29:03	11.7	9.13	100.3	7.78	44452	28.64
Composite 6	D	25	12/16/2018 12:29:26	11.7	9.13	100.3	7.78	44337	28.56
Composite 6	E	25	12/16/2018 12:29:57	11.7	9.16	100.7	7.79	44283	28.52
Laboratory Control	A	26	12/17/2018 11:55:09	11.8	8.25	93.4	7.64	46557	30.15
Laboratory Control	B	26	12/17/2018 11:55:30	11.7	8.79	99.3	7.68	46656	30.22
Laboratory Control	C	26	12/17/2018 11:55:45	11.6	8.84	99.7	7.70	46712	30.25
Laboratory Control	D	26	12/17/2018 11:56:06	11.4	9.10	102.2	7.73	46716	30.25
Laboratory Control	E	26	12/17/2018 11:56:26	11.3	9.01	101.1	7.73	46703	30.24
CLDS Reference	A	26	12/17/2018 11:56:48	11.3	9.16	102.6	7.77	46798	30.30
CLDS Reference	B	26	12/17/2018 11:57:27	11.1	9.15	102.1	7.78	46688	30.22
CLDS Reference	C	26	12/17/2018 11:57:47	11.4	9.15	102.9	7.80	46858	30.35
CLDS Reference	D	26	12/17/2018 11:58:03	11.4	9.11	102.5	7.80	46852	30.35
CLDS Reference	E	26	12/17/2018 11:58:16	11.4	9.06	101.8	7.80	46720	30.25
Composite 2	A	26	12/17/2018 11:58:38	11.5	8.87	99.7	7.80	46779	30.30
Composite 2	B	26	12/17/2018 11:58:59	11.6	8.94	100.8	7.79	46749	30.28
Composite 2	C	26	12/17/2018 11:59:40	11.8	8.84	100.3	7.79	46980	30.46
Composite 2	D	26	12/17/2018 11:59:55	11.5	8.72	98.0	7.77	46497	30.10
Composite 2	E	26	12/17/2018 12:00:11	11.6	8.62	97.4	7.77	46809	30.33
Composite 3	A	26	12/17/2018 12:00:26	11.7	8.77	99.4	7.78	46945	30.43
Composite 3	B	26	12/17/2018 12:00:47	11.6	8.86	99.9	7.79	46837	30.34
Composite 3	C	26	12/17/2018 12:01:09	11.5	8.79	99.0	7.79	46808	30.32
Composite 3	D	26	12/17/2018 12:01:28	11.4	8.71	97.8	7.78	46913	30.39
Composite 3	E	26	12/17/2018 12:01:51	11.2	8.71	97.4	7.78	46716	30.24
Composite 4	A	26	12/17/2018 12:02:13	11.3	8.80	98.6	7.78	46726	30.25
Composite 4	B	26	12/17/2018 12:02:28	11.3	8.72	97.7	7.78	46695	30.23
Composite 4	C	26	12/17/2018 12:02:44	11.4	8.85	99.4	7.78	46876	30.36
Composite 4	D	26	12/17/2018 12:03:06	11.3	8.98	100.8	7.79	46899	30.38
Composite 4	E	26	12/17/2018 12:03:43	11.5	8.57	96.4	7.77	46573	30.15
Composite 5	A	26	12/17/2018 12:04:09	11.5	8.79	98.8	7.80	46550	30.13
Composite 5	B	26	12/17/2018 12:04:31	11.8	8.83	100.1	7.79	46926	30.42
Composite 5	C	26	12/17/2018 12:04:53	11.8	8.77	99.3	7.81	46923	30.41
Composite 5	D	26	12/17/2018 12:05:14	12.1	8.95	102.3	7.81	47088	30.55
Composite 5	E	26	12/17/2018 12:05:29	11.6	8.94	100.8	7.80	46665	30.22
Composite 6	A	26	12/17/2018 12:05:51	11.6	8.76	98.9	7.80	46805	30.32
Composite 6	B	26	12/17/2018 12:06:16	11.5	8.83	99.4	7.80	46662	30.22

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	C	26	12/17/2018 12:06:42	11.5	8.78	98.7	7.80	46594	30.16
Composite 6	D	26	12/17/2018 12:07:00	11.6	8.82	99.4	7.80	46785	30.31
Composite 6	E	26	12/17/2018 12:07:16	11.4	8.75	98.2	7.79	46512	30.10
Laboratory Control	A	27	12/18/2018 08:22:53	11.8	8.22	92.0	7.46	45694	29.53
Laboratory Control	B	27	12/18/2018 08:23:12	11.7	8.93	99.8	7.53	45852	29.64
Laboratory Control	C	27	12/18/2018 08:23:34	11.6	8.87	99.0	7.55	45932	29.69
Laboratory Control	D	27	12/18/2018 08:23:52	11.3	9.19	102.0	7.60	45944	29.69
Laboratory Control	E	27	12/18/2018 08:24:09	11.2	9.17	101.5	7.61	45927	29.67
CLDS Reference	A	27	12/18/2018 08:25:54	11.8	8.26	92.4	7.62	45690	29.53
CLDS Reference	B	27	12/18/2018 08:26:20	11.7	8.91	99.6	7.65	45843	29.63
CLDS Reference	C	27	12/18/2018 08:26:33	11.6	8.89	99.2	7.65	45932	29.69
CLDS Reference	D	27	12/18/2018 08:26:51	11.3	9.19	101.9	7.69	45937	29.69
CLDS Reference	E	27	12/18/2018 08:27:12	11.2	9.15	101.3	7.69	45929	29.68
Composite 2	A	27	12/18/2018 08:27:35	11.2	9.33	103.2	7.73	46038	29.75
Composite 2	B	27	12/18/2018 08:28:11	11.1	9.30	102.6	7.76	45946	29.68
Composite 2	C	27	12/18/2018 08:28:32	11.3	9.34	103.7	7.77	46077	29.79
Composite 2	D	27	12/18/2018 08:28:48	11.3	9.30	103.3	7.77	46084	29.79
Composite 2	E	27	12/18/2018 08:29:02	11.3	9.26	102.8	7.77	45931	29.68
Composite 3	A	27	12/18/2018 08:29:17	11.4	9.07	100.8	7.76	45941	29.69
Composite 3	B	27	12/18/2018 08:29:38	11.5	9.10	101.3	7.76	46016	29.75
Composite 3	C	27	12/18/2018 08:33:36	11.8	8.84	99.1	7.75	46132	29.85
Composite 3	D	27	12/18/2018 08:33:55	11.6	8.76	97.5	7.74	45637	29.48
Composite 3	E	27	12/18/2018 08:34:11	11.7	8.60	96.3	7.73	45996	29.75
Composite 4	A	27	12/18/2018 08:34:25	11.9	8.71	97.8	7.74	46083	29.82
Composite 4	B	27	12/18/2018 08:34:37	11.6	8.92	99.6	7.75	46044	29.78
Composite 4	C	27	12/18/2018 08:34:58	11.6	8.84	98.6	7.76	46020	29.76
Composite 4	D	27	12/18/2018 08:35:20	11.4	8.71	96.9	7.75	46074	29.79
Composite 4	E	27	12/18/2018 08:35:37	11.2	8.75	96.7	7.75	45844	29.61
Composite 5	A	27	12/18/2018 08:35:52	11.3	8.83	97.9	7.75	45945	29.69
Composite 5	B	27	12/18/2018 08:36:07	11.3	8.74	97.0	7.75	45927	29.68
Composite 5	C	27	12/18/2018 08:36:24	11.3	9.00	99.8	7.76	46122	29.82
Composite 5	D	27	12/18/2018 08:36:38	11.1	9.14	101.0	7.77	46088	29.79
Composite 5	E	27	12/18/2018 08:44:06	11.5	8.54	95.1	7.74	45767	29.57
Composite 6	A	27	12/18/2018 08:44:28	11.6	8.88	98.9	7.79	45681	29.51
Composite 6	B	27	12/18/2018 08:44:40	12.0	8.87	99.8	7.79	46064	29.81
Composite 6	C	27	12/18/2018 08:44:54	12.0	8.86	99.7	7.80	46025	29.78
Composite 6	D	27	12/18/2018 08:45:16	12.4	8.97	101.8	7.79	46087	29.84
Composite 6	E	27	12/18/2018 08:45:38	11.7	9.02	100.8	7.80	45887	29.67
Laboratory Control	A	28	12/19/2018 09:17:47	12.1	8.49	94.4	7.55	45192	29.19
Laboratory Control	B	28	12/19/2018 09:18:25	12.0	8.97	99.6	7.62	45279	29.25
Laboratory Control	C	28	12/19/2018 09:18:58	11.8	8.99	99.4	7.63	45312	29.26
Laboratory Control	D	28	12/19/2018 09:20:12	11.4	9.19	100.8	7.69	45292	29.23

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.6	8.83	97.6		45650	29.50
Minimum:	11.0	5.26	57.7	7.14	40364	25.74
Maximum:	12.4	9.58	105.5	8.00	49139	32.01

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	E	28	12/19/2018 09:20:42	11.4	9.07	99.3	7.68	45286	29.22
CLDS Reference	A	28	12/19/2018 09:21:10	11.3	9.31	101.9	7.73	45406	29.31
CLDS Reference	B	28	12/19/2018 09:21:46	11.2	9.30	101.4	7.75	45331	29.25
CLDS Reference	C	28	12/19/2018 09:22:19	11.4	9.30	101.9	7.78	45429	29.32
CLDS Reference	D	28	12/19/2018 09:22:51	11.5	9.26	101.8	7.78	45448	29.35
CLDS Reference	E	28	12/19/2018 09:23:23	11.6	9.16	100.8	7.78	45300	29.24
Composite 2	A	28	12/19/2018 09:24:07	11.7	8.97	98.9	7.77	45353	29.28
Composite 2	B	28	12/19/2018 09:24:39	11.8	9.03	99.8	7.77	45448	29.35
Composite 2	C	28	12/19/2018 09:25:50	11.9	8.85	98.0	7.76	45410	29.33
Composite 2	D	28	12/19/2018 09:26:21	11.8	8.86	97.9	7.75	45196	29.18
Composite 2	E	28	12/19/2018 09:26:52	11.6	8.42	92.6	7.72	45326	29.26
Composite 3	A	28	12/19/2018 09:27:37	11.6	8.61	94.7	7.73	45375	29.30
Composite 3	B	28	12/19/2018 09:28:16	11.4	8.99	98.6	7.75	45365	29.28
Composite 3	C	28	12/19/2018 09:28:49	11.6	8.84	97.3	7.75	45348	29.28
Composite 3	D	28	12/19/2018 09:29:16	11.3	8.70	95.2	7.73	45371	29.28
Composite 3	E	28	12/19/2018 09:29:36	11.3	8.73	95.4	7.74	45199	29.15
Composite 4	A	28	12/19/2018 09:30:04	11.3	8.76	95.7	7.73	45277	29.21
Composite 4	B	28	12/19/2018 09:30:39	11.3	8.23	89.9	7.70	45247	29.19
Composite 4	C	28	12/19/2018 09:31:19	11.4	8.98	98.4	7.75	45429	29.33
Composite 4	D	28	12/19/2018 09:32:00	11.5	9.08	99.8	7.77	45478	29.37
Composite 4	E	28	12/19/2018 09:33:33	11.9	8.78	97.1	7.76	45203	29.18
Composite 5	A	28	12/19/2018 09:34:14	11.7	8.91	98.4	7.79	45160	29.15
Composite 5	B	28	12/19/2018 09:34:44	11.9	8.89	98.5	7.79	45335	29.28
Composite 5	C	28	12/19/2018 09:35:19	11.8	8.93	98.8	7.82	45317	29.26
Composite 5	D	28	12/19/2018 09:36:13	11.9	8.78	97.3	7.79	45326	29.27
Composite 5	E	28	12/19/2018 09:36:53	11.6	9.02	99.2	7.79	45203	29.17
Composite 6	A	28	12/19/2018 09:37:37	11.6	8.73	96.1	7.77	45324	29.26
Composite 6	B	28	12/19/2018 09:38:52	11.5	8.73	95.7	7.77	45219	29.18
Composite 6	C	28	12/19/2018 09:39:32	11.5	8.69	95.3	7.76	45017	29.03
Composite 6	D	28	12/19/2018 09:40:13	11.6	8.70	95.8	7.77	45278	29.23
Composite 6	E	28	12/19/2018 09:40:58	11.7	8.81	97.1	7.79	45241	29.20

Macoma nasuta
28 day Bioaccumulation Evaluation

Statistical Analysis Reports

Survival

CETIS Test Data Worksheet

Report Date: 27 Dec-18 10:47 (p 1 of 1)
Test Code/ID: 01-9939-1409/31249Mn-Surv

Bioaccumulation Evaluation - Survival Endpoint			EnviroSystems, Inc.		
Start Date: 21 Nov-18 12:00	Species: Macoma nasuta	Sample Code: 31249-000			
End Date: 19 Dec-18 12:00	Protocol: US ACE NED RIM (2004)	Sample Source: New Haven Harbor 2018			
Sample Date: 21 Nov-18	Material: Laboratory Control Sediment	Sample Station: Laboratory Control (Mn)			

Sample	Rep	Pos	# Exposed	# Survived	Notes
31249-000	1	7	20	20	
31249-000	2	10	20	19	
31249-000	3	16	20	20	
31249-000	4	25	20	20	
31249-000	5	34	20	20	
31242-008	1	3	20	20	
31242-008	2	11	20	20	
31242-008	3	19	20	20	
31242-008	4	23	20	20	
31242-008	5	33	20	19	
31243-101	1	1	20	20	
31243-101	2	8	20	20	
31243-101	3	18	20	20	
31243-101	4	22	20	20	
31243-101	5	35	20	20	
31243-102	1	5	20	20	
31243-102	2	9	20	20	
31243-102	3	15	20	18	
31243-102	4	26	20	20	
31243-102	5	31	20	20	
31243-103	1	4	20	19	
31243-103	2	12	20	18	
31243-103	3	20	20	19	
31243-103	4	27	20	20	
31243-103	5	29	21	21	
31243-104	1	6	20	18	
31243-104	2	14	20	18	
31243-104	3	17	20	18	
31243-104	4	28	20	20	
31243-104	5	30	20	20	
31243-105	1	2	20	20	
31243-105	2	13	20	20	
31243-105	3	21	20	18	
31243-105	4	24	22	22	
31243-105	5	32	20	20	

CETIS Summary Report

Report Date: 28 Dec-18 10:35 (p 1 of 1)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint **EnviroSystems, Inc.**

Batch ID: 09-8484-4680	Test Type: Survival	Analyst: Nancy Roka
Start Date: 21 Nov-18 12:00	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 19 Dec-18 12:00	Species: Macoma nasuta	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31249-000	16-6162-6890	21 Nov-18	21 Nov-18	12h	AECOM	Dredged Sediment Evalu
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h		
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31249-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Mn)	
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
06-7090-7592	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.7778	31242-008 passed proportion survived
06-7315-4018	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-101 passed proportion survived
13-6711-0421	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-101 passed proportion survived
04-1462-7524	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-102 passed proportion survived
21-3547-0895	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5556	31243-102 passed proportion survived
21-1783-4608	Proportion Survived	Equal Variance t Two-Sample Test	0.1006	31243-103 passed proportion survived
10-7841-9910	Proportion Survived	Equal Variance t Two-Sample Test	0.0518	31243-104 passed proportion survived
06-2798-0718	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-105 passed proportion survived
12-8678-4349	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5556	31243-105 passed proportion survived

Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31249-000	LC	5	0.990	0.962	1.000	0.950	1.000	0.010	0.022	2.26%	0.00%
31242-008	RS	5	0.990	0.962	1.000	0.950	1.000	0.010	0.022	2.26%	0.00%
31243-101		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	-1.01%
31243-102		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	1.01%
31243-103		5	0.960	0.908	1.000	0.900	1.000	0.019	0.042	4.36%	3.03%
31243-104		5	0.940	0.872	1.000	0.900	1.000	0.025	0.055	5.83%	5.05%
31243-105		5	0.980	0.924	1.000	0.900	1.000	0.020	0.045	4.56%	1.01%

Proportion Survived Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31249-000	LC	1.000	0.950	1.000	1.000	1.000	
31242-008	RS	1.000	1.000	1.000	1.000	0.950	
31243-101		1.000	1.000	1.000	1.000	1.000	
31243-102		1.000	1.000	0.900	1.000	1.000	
31243-103		0.950	0.900	0.950	1.000	1.000	
31243-104		0.900	0.900	0.900	1.000	1.000	
31243-105		1.000	1.000	0.900	1.000	1.000	

CETIS Analytical Report

Report Date: 28 Dec-18 10:35 (p 1 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 06-7090-7592		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:34		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31249-000	16-6162-6890	21 Nov-18	21 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31249-000	Laboratory Control Sediment	New Haven Harbor 2018		Laboratory Control (Mn)							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31242-008 passed proportion survived					2.76%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Lab Control Sedime		Reference Sed	27.5	n/a	2	8	Exact	0.7778	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.9	2.29	0.3527	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0206028	0.0025754	8								
Total	0.0206028		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.509	0.741	4.7E-06	Non-Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31249-000	LC	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31249-000	LC	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31249-000	LC	1.000	0.950	1.000	1.000	1.000					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31249-000	LC	1.46	1.35	1.46	1.46	1.46					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					

CETIS Analytical Report

Report Date: 09 Jan-19 12:34 (p 1 of 1)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint										EnviroSystems, Inc.	
Analysis ID: 06-7315-4018		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:34		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Angular (Corrected)	C > T		31243-101 passed proportion survived				2.12%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	30	n/a	1	8	Exact	1.0000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0012877	0.0012877	1	1	0.3466	Non-Significant Effect					
Error	0.0103014	0.0012877	8								
Total	0.0115891		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Levene Equality of Variance Test		7.11	11.3	0.0285	Equal Variances					
Variances	Mod Levene Equality of Variance Test		1	13.7	0.3559	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.625	0.741	1.1E-04	Non-Normal Distribution					
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31243-101		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-1.01%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31243-101		5	1.46	1.46	1.46	1.46	1.46	1.46	0	0.00%	-1.58%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-101		1.000	1.000	1.000	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					
31243-101		1.46	1.46	1.46	1.46	1.46					

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Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint **EnviroSystems, Inc.**

Analysis ID: 13-6711-0421	Endpoint: Proportion Survived	CETIS Version: CETISv1.9.3
Analyzed: 28 Dec-18 10:34	Analysis: Nonparametric-Two Sample	Official Results: Yes

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed		31243-101	25	n/a	1	7	Exact	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<1.0E-37	Significant Effect
Error	0	0	7			
Total	0		8			

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
31243-101		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	1.46	1.46	1.46	1.46	1.46	1.46	0	0.00%	0.00%
31243-101		5	1.46	1.46	1.46	1.46	1.46	1.46	0	0.00%	0.00%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	1.000	1.000	1.000	1.000	Outlier
31243-101		1.000	1.000	1.000	1.000	1.000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	1.46	1.46	1.46	1.46	
31243-101		1.46	1.46	1.46	1.46	1.46

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Report Date: 09 Jan-19 12:34 (p 1 of 1)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID:	04-1462-7524		Endpoint:	Proportion Survived			CETIS Version:	CETISv1.9.3			
Analyzed:	28 Dec-18 10:34		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Angular (Corrected)	C > T	31243-102 passed proportion survived					3.95%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	27	n/a	1	8	Exact	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.36	2.29	0.0301	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0009262	0.0009262	1	0.163	0.6971	Non-Significant Effect					
Error	0.045485	0.0056856	8								
Total	0.0464112		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.42	23.2	0.2613	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.639	0.741	1.6E-04	Non-Normal Distribution						
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000		0.950	1.000	0.010	2.26%	0.00%
31243-102		5	0.980	0.924	1.000		0.900	1.000	0.020	4.56%	1.01%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5		1.35	1.46	0.0227	3.53%	0.00%
31243-102		5	1.42	1.3	1.53		1.25	1.46	0.0419	6.62%	1.34%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-102		1.000	1.000	0.900	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS										
31243-102											

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Report Date: 28 Dec-18 10:35 (p 3 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.					
Analysis ID: 21-3547-0895		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3							
Analyzed: 28 Dec-18 10:34		Analysis: Nonparametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)								
Data Transform	Alt Hyp		Comparison Result				PMSD					
Angular (Corrected)	C > T		31243-102 passed proportion survived				2.35%					
Wilcoxon Rank Sum Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-102	22	n/a	1	7	Exact	0.5556	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0011446		0.0011446	1	0.778	0.4071	Non-Significant Effect					
Error	0.0103014		0.0014716	7								
Total	0.011446			8								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Levene Equality of Variance Test			5.53	12.2	0.0510	Equal Variances					
Variances	Mod Levene Equality of Variance Test			1	13.7	0.3559	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.634	0.701	2.4E-04	Non-Normal Distribution					
Proportion Survived Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%	
31243-102		4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-1.01%	
Angular (Corrected) Transformed Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%	
31243-102		4	1.46	1.46	1.46	1.46	1.46	1.46	0	0.00%	-1.58%	
Proportion Survived Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	1.000	1.000	1.000	1.000	0.950						
31243-102		1.000	1.000	Outlier	1.000	1.000						
Angular (Corrected) Transformed Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	1.46	1.46	1.46	1.46	1.35						
31243-102		1.46	1.46	1.46	1.46							

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Report Date: 28 Dec-18 10:35 (p 4 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID:	21-1783-4608		Endpoint:	Proportion Survived			CETIS Version:	CETISv1.9.3			
Analyzed:	28 Dec-18 10:34		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Angular (Corrected)	C > T	31243-103 passed proportion survived					3.81%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	1.39	1.86	0.086	8	CDF	0.1006	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5119	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0102706	0.0102706	1	1.94	0.2013	Non-Significant Effect					
Error	0.0423786	0.0052973	8								
Total	0.0526492		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.11	23.2	0.2971	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.915	0.741	0.3183	Normal Distribution						
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31243-103		5	0.960	0.908	1.000	0.950	0.900	1.000	0.019	4.36%	3.03%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31243-103		5	1.37	1.26	1.48	1.35	1.25	1.46	0.04	6.53%	4.46%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-103		0.950	0.900	0.950	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					
31243-103		1.35	1.25	1.35	1.46	1.46					

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Report Date: 28 Dec-18 10:35 (p 5 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 10-7841-9910		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-104 passed proportion survived					4.66%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.84	1.86	0.104	8	CDF	0.0518	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0265908		0.0265908	1	3.37	0.1036	Non-Significant Effect				
Error	0.0630768		0.0078846	8							
Total	0.0896676			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.12	23.2	0.1426	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.833	0.741	0.0361	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31243-104		5	0.940	0.872	1.000	0.900	0.900	1.000	0.025	5.83%	5.05%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31243-104		5	1.33	1.19	1.48	1.25	1.25	1.46	0.0514	8.62%	7.18%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-104		0.900	0.900	0.900	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					
31243-104		1.25	1.25	1.25	1.46	1.46					

CETIS Analytical Report

Report Date: 28 Dec-18 10:35 (p 6 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint										EnviroSystems, Inc.	
Analysis ID: 06-2798-0718		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:34		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Angular (Corrected)	C > T		31243-105 passed proportion survived				3.97%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	27	n/a	1	8	Exact	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.36	2.29	0.0295	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0008282	0.0008282	1	0.144	0.7140	Non-Significant Effect					
Error	0.045946	0.0057433	8								
Total	0.0467742		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		3.46	23.2	0.2565	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.65	0.741	2.2E-04	Non-Normal Distribution					
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31243-105		5	0.980	0.924	1.000	1.000	0.900	1.000	0.020	4.56%	1.01%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31243-105		5	1.42	1.3	1.54	1.46	1.25	1.46	0.0422	6.66%	1.27%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-105		1.000	1.000	0.900	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					
31243-105		1.46	1.46	1.25	1.46	1.46					

CETIS Analytical Report

Report Date: 28 Dec-18 10:35 (p 7 of 7)
Test Code: 31249Mn-Surv | 01-9939-1409

Bioaccumulation Evaluation - Survival Endpoint										EnviroSystems, Inc.	
Analysis ID: 12-8678-4349		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:34		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform		Alt Hyp			Comparison Result				PMSD		
Angular (Corrected)		C > T			31243-105 passed proportion survived				2.35%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	22	n/a	1	7	Exact	0.5556	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0012804		0.0012804		1	0.868	0.3824	Non-Significant Effect			
Error	0.0103219		0.0014746		7						
Total	0.0116023				8						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			376	46.2	4.4E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.645	0.701	3.3E-04	Non-Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	0.00%
31243-105		4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	-1.01%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	0.00%
31243-105		4	1.46	1.46	1.46	1.46	1.46	1.46	0.0013	0.18%	-1.67%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	1.000	1.000	0.950					
31243-105		1.000	1.000	Outlier	1.000	1.000					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.46	1.46	1.35					
31243-105		1.46	1.46	1.46	1.46						

Nereis virens
28 day Bioaccumulation Evaluation
Bench Data

28 DAY BIOACCUMULATION ASSAY

Project: New Haven Harbor 2018	Client: AECOM	
Study #: 31250	Reference: CLDS	Water Bath: TCR
Sample(s): Comps 2, 3, 4, 5 and 6	Start: 11/20/2018	End: 12/18/2018

Summary of Test Conditions

Exposure	Species Used
<p>Test Mode: Flow Through (6 volume additions per day)</p> <p>Length of Assay: 28 days</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> Polychaete (<i>Nereis virens</i>)</p> <p><input type="checkbox"/> Bivalve Clam (<i>Macoma nasuta</i>)</p>

Water Quality Parameters

<p>Salinity: 30 ± 2 ppt</p> <p>Photoperiod: 16 hour light, 8 hour dark</p>	<p>Temperature: 12-16°C with no readings to exceed ±3°C</p>
--	--

Test Chamber	Solution & Sediment Volume
<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> 38L (10 gallon) Aquaria</p> <p><input type="checkbox"/> other _____</p>	<p style="text-align: center;">(Check box for all that apply)</p> <p><input checked="" type="checkbox"/> ~6L per vessel of homogenized sediment</p> <p><input checked="" type="checkbox"/> 20-30L overlying water</p> <p><input type="checkbox"/> other _____</p>

Replicate Information

N. virens and *M. nasuta*:

- 5 Reps per sample site and reference site
- 5 Reps for Laboratory Control
- 20 organisms per chamber

Cleaning	Treatments
<p>Prior to test initiation, all test vessels were washed using lab safe detergent, acid washed then rinsed with deionized water (EPA 2002).</p>	<p>Laboratory Control, Reference Site, and Site Sediments</p>

Feeding

<i>N. virens</i> :	<i>M. nasuta</i> :
NONE	NONE

Date: 2/14/18

Initial NR



99Nv ARO112018

Aquatic Research Organisms

DATA SHEET/ CUSTODY CHAIN

I. Organism History

Species Neanthes (Neries) virens

Source: Lab reared _____ Hatchery reared _____ Field collected X

Hatch date Mixed aged adults Receipt date 11/20/18

Lot number 112018NW Strain Wild

Brood origination: Damariscotta River, Boothbay Harbor, Maine

II. Water Quality

Temperature 12 °C Salinity 28-32 ppt D.O. Saturated ppm

pH 8.0-8.4 su Hardness N.A. ppm Alkalinity N.A. ppm

III. Culture Conditions

Freshwater _____ Saltwater X Other _____

Recirculating _____ Flow through _____ Static _____

DIET: Flake food _____ Phytoplankton _____ Trout chow _____

Artemia _____ Rotifers _____ YCT _____ Other Not fed

Prophylactic treatments: _____

Comments: Held at 4C on moist seaweed. Shipped with gel ice packs to keep cool

IV. Shipping Information

Client: ESI # of Organisms 1100+

Carrier: FedEx Pick Up Date shipped 11/20/18

Tracking # N/A # of boxes 10

Released by: Ston Santel Date: 11/20/18 Time: _____

Received by: _____ Date: _____ Time: _____

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

Nereis virens 28 Day Study

Client: AECOM

Study: 31250

Day	Date	Water Qualities and Flow	Initial	Day	Date	Water Qualities and Flow	Initial
0	11/20/18	✓	BG	15	12/05/18	✓	MS
1	11/28/18 ^{MS}	✓	BG	16	12/06/18	✓	BG
2	11/22/18	✓	LAG	17	12/07/18	✓	BG
3	11/23/18	✓	LAG	18	12/08/18	✓	BG
4	11/24/18	✓	LAG ^{BG}	19	12/09/18	✓	MS
5	11/25/18	✓	LAG	20	12/10/18	✓	MS
6	11/26/18	✓	MS	21	12/11/18	✓	MS
7	11/27/18	✓	MS	22	12/12/18	✓	MS
8	11/28/18	✓	LAG	23	12/13/18	✓	MS
9	11/29/18	✓	BG	24	12/14/18	✓	BG
10	11/30/18	✓	BG	25	12/15/18	✓	BG
11	12/01/18	✓	BG	26	12/16/18	✓	MS
12	12/02/18	✓	MS	27	12/17/18	✓	MS
13	12/03/18	✓	MS	28	12/18/18	✓	MS
14	12/04/18	✓	MS				

Notes: ^{MS} 12/26/18 Camp 3 E air was increased due to low flow

^{BG} 12/01/18 Low salinities observed; salinity increased in head tanks

Client: AECOM		Daily Observations for <i>Nereis virens</i>													
		Study: 31250													
TANK	DAY														
	Rep	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Laboratory Control	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	D	✓	✓	✓	✓	IS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory Control	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLDS Ref Site	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 2	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Composite 3	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initial Date		BG 11/21/18	LAG 11/22/18	BS LAG 11/23/18	BS 11/24/18	LAG MS 11/25/18	MS 11/26/18	MS 11/27/18	LAG BS 11/28/18	BS BG 11/29/18	BG MS 12/01/18	MS MS 12/03/18	MS MS 12/05/18	MS MS 12/07/18	BS BG 12/09/18

BS
11/24

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Nereis virens</i>														Study: 31250	
TANK	DAY																
	Rep	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Composite 4	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 4	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 4	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 4	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 4	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 5	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 5	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 5	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 5	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 5	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 6	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 6	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 6	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 6	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Composite 6	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Initial		B6	LAG	LAG	B6	LAG	MS	MS	LAG	B6	B6	B6	MS	MS	B6		
Date		11/21/18	11/22/18	11/23/18	11/24/18	11/25/18	11/26/18	11/27/18	11/28/18	11/29/18	11/30/18	12/01/18	12/02/18	12/03/18	12/04/18		

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Nereis virens</i>													Study: 31250
TANK	DAY														
	Rep	15	16	17	18	19	20	21	22	23	24	25	26	27	
Laboratory Control	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Laboratory Control	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Laboratory Control	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Laboratory Control	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Laboratory Control	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CLDS Ref Site	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CLDS Ref Site	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CLDS Ref Site	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CLDS Ref Site	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CLDS Ref Site	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 2	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 2	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 2	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 2	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 2	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 3	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 3	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 3	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 3	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 3	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Initial		MS	B6	B6	B6	MS	MS	MS	MS	MS	B6	B6	MS	MS	
Date		12/15/18	12/16/18	12/17/18	12/18/18	12/19/18	12/20/18	12/21/18	12/22/18	12/23/18	12/24/18	12/25/18	12/26/18	12/27/18	

Observation Codes:

- R animals replaced after 1 hour
- D dead animals

- S animals observed on the surface
- ✓ tank checked and no animals were on the surface or dead

Client: AECOM		Daily Observations for <i>Nereis virens</i>													Study: 31250
TANK	DAY														
	Rep	15	16	17	18	19	20	21	22	23	24	25	26	27	
Composite 4	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 4	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 5	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Composite 6	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Initial Date		MS 12/05/18	BG 12/06/18	BG 12/07/18	BG 12/08/18	MS 12/09/18	MS 12/10/18	MS 12/11/18	MS 12/12/18	MS 12/13/18	BG 12/14/18	BG 12/15/18	MS 12/16/18	MS 12/17/18	

Observation Codes:

R animals replaced after 1 hour

D dead animals

S animals observed on the surface

✓ tank checked and no animals were on the surface or dead

Nereis virens Day 28 Recovery Record

DATE: 12/18/18

ESI STUDY: 31250

CLIENT: AECOM

PROJECT: New Haven Harbor

SAMPLE ID	REP	# LIVE / INITIALS	SAMPLE ID	REP	# LIVE / INITIALS
Laboratory Control Sediment	A	19 JTP	Composite 2	A	20 JTP
Laboratory Control Sediment	B	21 MS	Composite 2	B	20 JTP
Laboratory Control Sediment	C	20 JTP	Composite 2	C	19 MS
Laboratory Control Sediment	D	19 MS	Composite 2	D	20 JTP
Laboratory Control Sediment	E	18 JTP	Composite 2	E	17 MS
CLDS Reference Sediment	A	20 MS	Composite 3	A	22 LAG
CLDS Reference Sediment	B	20 JTP	Composite 3	B	19 JTP
CLDS Reference Sediment	C	19 MS	Composite 3	C	20 MS
CLDS Reference Sediment	D	20 JTP	Composite 3	D	19 JTP
CLDS Reference Sediment	E	19 MS	Composite 3	E	19 MS

Nereis virens Day 28 Recovery Record

DATE: 12/18/18 ESI STUDY: 31250
 CLIENT: AECOM PROJECT: New Haven Harbor

SAMPLE ID	REP	# LIVE / INITIALS	SAMPLE ID	REP	# LIVE / INITIALS
Composite 4	A	20 JTP	Composite 6	A	20 (MT) ^{MS} 12/18
Composite 4	B	20 LAG	Composite 6	B	19 MW
Composite 4	C	19 JTP	Composite 6	C	17 MS
Composite 4	D	19 JTP	Composite 6	D	20 MS
Composite 4	E	19 LAG	Composite 6	E	18 LAG
Composite 5	A	19 MS			
Composite 5	B	19 LAG			
Composite 5	C	19 MS			
Composite 5	D	18 LAG			
Composite 5	E	18 MS			

Nereis virens
28 day Bioaccumulation Evaluation
Daily Water Quality Data

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	00	11/20/2018 15:52:14	11.6	8.73	97.9	7.85	47355	30.72
Laboratory Control	B	00	11/20/2018 15:52:41	11.3	8.26	91.0	7.81	45062	29.06
Laboratory Control	C	00	11/20/2018 15:53:04	11.3	8.03	88.6	7.79	45474	29.35
Laboratory Control	D	00	11/20/2018 15:53:25	11.2	7.70	84.6	7.77	44896	28.93
Laboratory Control	E	00	11/20/2018 15:53:46	11.2	7.59	83.6	7.73	45509	29.37
CLDS Reference	A	00	11/20/2018 15:54:10	11.1	8.17	89.4	7.80	44552	28.68
CLDS Reference	B	00	11/20/2018 15:54:32	11.3	8.50	94.5	7.83	46862	30.35
CLDS Reference	C	00	11/20/2018 15:55:05	11.5	8.67	97.0	7.86	47397	30.74
CLDS Reference	D	00	11/20/2018 15:55:31	11.3	7.94	87.8	7.86	45785	29.58
CLDS Reference	E	00	11/20/2018 15:55:53	11.3	8.59	95.2	7.86	46318	29.96
Composite 2	A	00	11/20/2018 15:56:17	11.4	7.73	86.1	7.78	46849	30.35
Composite 2	B	00	11/20/2018 15:56:45	11.3	7.74	85.6	7.75	45988	29.72
Composite 2	C	00	11/20/2018 15:57:10	11.2	7.84	86.1	7.74	44652	28.76
Composite 2	D	00	11/20/2018 15:57:56	11.3	7.25	79.6	7.71	44481	28.64
Composite 2	E	00	11/20/2018 15:58:20	11.1	7.80	85.6	7.72	44892	28.93
Composite 3	A	00	11/20/2018 15:58:41	11.2	8.61	95.1	7.75	46225	29.88
Composite 3	B	00	11/20/2018 15:59:05	11.2	7.97	88.1	7.73	46169	29.85
Composite 3	C	00	11/20/2018 15:59:38	11.1	8.82	97.0	7.80	45407	29.30
Composite 3	D	00	11/20/2018 15:59:58	11.4	8.41	93.7	7.78	47083	30.51
Composite 3	E	00	11/20/2018 16:00:21	11.0	9.21	98.9	7.85	41022	26.18
Composite 4	A	00	11/20/2018 16:00:45	11.1	7.34	80.5	7.75	45110	29.08
Composite 4	B	00	11/20/2018 16:01:06	11.1	7.81	85.4	7.77	44612	28.73
Composite 4	C	00	11/20/2018 16:01:25	11.1	7.36	80.7	7.74	45111	29.08
Composite 4	D	00	11/20/2018 16:01:52	11.1	7.76	84.9	7.77	44612	28.73
Composite 4	E	00	11/20/2018 16:02:17	11.2	7.69	84.8	7.72	45262	29.20
Composite 5	A	00	11/20/2018 16:02:48	11.2	6.49	71.2	7.64	44313	28.52
Composite 5	B	00	11/20/2018 16:03:44	11.1	8.03	88.1	7.66	45071	29.06
Composite 5	C	00	11/20/2018 16:04:05	11.1	7.83	85.7	7.64	44456	28.62
Composite 5	D	00	11/20/2018 16:04:27	11.4	8.45	94.1	7.71	47278	30.65
Composite 5	E	00	11/20/2018 16:04:51	11.6	7.65	85.2	7.69	45887	29.67
Composite 6	A	00	Multiprobe malfunction						
Composite 6	B	00	11/20/2018 16:40:34	11.1	8.31	91.4	7.32	45661	29.48
Composite 6	C	00	11/20/2018 16:40:55	11.1	7.85	85.8	7.42	44425	28.59
Composite 6	D	00	11/20/2018 16:41:14	11.1	7.15	78.2	7.47	44508	28.65
Composite 6	E	00	11/20/2018 16:41:30	11.3	8.19	90.6	7.51	46036	29.76
Laboratory Control	A	01	11/21/2018 02:43:11	11.5	7.47	83.7	7.75	48419	31.48
Laboratory Control	B	01	11/21/2018 02:43:46	11.4	8.79	97.6	7.80	46927	30.40
Laboratory Control	C	01	11/21/2018 02:44:10	11.5	8.43	94.2	7.78	47870	31.08
Laboratory Control	D	01	11/21/2018 02:44:35	11.6	8.52	95.7	7.79	48560	31.59
Laboratory Control	E	01	11/21/2018 02:45:05	11.2	8.52	93.8	7.77	46105	29.80
CLDS Reference	A	01	11/21/2018 02:45:30	11.4	8.45	94.2	7.79	47923	31.11
CLDS Reference	B	01	11/21/2018 02:45:56	11.2	8.62	95.7	7.80	47824	31.03
CLDS Reference	C	01	11/21/2018 02:46:20	11.3	8.46	94.4	7.80	48299	31.38
CLDS Reference	D	01	11/21/2018 02:46:46	11.1	8.61	94.9	7.80	46536	30.10
CLDS Reference	E	01	11/21/2018 02:47:10	11.1	8.64	95.7	7.80	47271	30.63

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	A	01	11/21/2018 02:47:38	11.1	8.68	96.1	7.83	47602	30.87
Composite 2	B	01	11/21/2018 02:48:02	11.2	8.50	93.8	7.84	46773	30.28
Composite 2	C	01	11/21/2018 02:48:25	11.4	8.64	96.2	7.86	47451	30.77
Composite 2	D	01	11/21/2018 02:48:57	11.3	5.68	62.4	7.71	45211	29.16
Composite 2	E	01	11/21/2018 02:49:23	11.1	8.48	93.1	7.85	45609	29.44
Composite 3	A	01	11/21/2018 02:49:49	11.1	7.80	86.2	7.76	47180	30.57
Composite 3	B	01	11/21/2018 02:50:11	11.1	8.69	96.1	7.84	47452	30.76
Composite 3	C	01	11/21/2018 02:50:39	11.1	8.24	90.9	7.80	46570	30.13
Composite 3	D	01	11/21/2018 02:50:57	11.3	8.12	90.3	7.78	47888	31.08
Composite 3	E	01	11/21/2018 02:51:28	11.3	7.85	86.8	7.77	46277	29.93
Composite 4	A	01	11/21/2018 02:51:50	11.0	8.81	96.8	7.87	46086	29.78
Composite 4	B	01	11/21/2018 02:52:13	11.0	8.69	95.1	7.87	45329	29.24
Composite 4	C	01	11/21/2018 02:52:36	11.3	8.42	94.0	7.85	48293	31.38
Composite 4	D	01	11/21/2018 02:53:04	11.2	8.74	97.3	7.90	48215	31.32
Composite 4	E	01	11/21/2018 02:53:41	11.1	8.49	93.2	7.88	45670	29.49
Composite 5	A	01	11/21/2018 02:54:14	11.6	8.47	95.3	7.82	48928	31.85
Composite 5	B	01	11/21/2018 02:54:40	11.1	8.66	95.2	7.87	45807	29.58
Composite 5	C	01	11/21/2018 02:55:04	11.1	8.68	95.1	7.89	45165	29.12
Composite 5	D	01	11/21/2018 02:55:27	11.4	8.43	94.2	7.83	48290	31.38
Composite 5	E	01	11/21/2018 02:55:51	12.0	8.35	95.0	7.84	49101	32.00
Composite 6	A	01	11/21/2018 02:56:25	11.0	8.96	98.6	7.87	46422	30.02
Composite 6	B	01	11/21/2018 02:56:44	11.0	8.90	97.0	7.92	44837	28.88
Composite 6	C	01	11/21/2018 02:57:05	11.0	8.79	95.9	7.90	44677	28.77
Composite 6	D	01	11/21/2018 02:57:31	11.2	8.13	89.9	7.86	46718	30.24
Composite 6	E	01	11/21/2018 02:57:48	11.2	8.43	92.6	7.87	45583	29.42
Laboratory Control	A	02	11/22/2018 10:06:10	11.4	7.99	88.6	7.72	49093	31.96
Laboratory Control	B	02	11/22/2018 10:06:37	11.4	9.06	100.1	7.81	48276	31.37
Laboratory Control	C	02	11/22/2018 10:07:05	11.6	8.71	96.7	7.81	48901	31.83
Laboratory Control	D	02	11/22/2018 10:07:37	11.5	8.89	98.7	7.82	49305	32.12
Laboratory Control	E	02	11/22/2018 10:08:05	11.5	8.78	96.8	7.83	47793	31.03
CLDS Reference	A	02	11/22/2018 10:08:37	11.5	8.72	96.5	7.84	48766	31.73
CLDS Reference	B	02	11/22/2018 10:09:08	11.5	8.79	97.4	7.84	48735	31.71
CLDS Reference	C	02	11/22/2018 10:10:06	11.4	8.64	95.7	7.84	48992	31.89
CLDS Reference	D	02	11/22/2018 10:10:30	11.3	8.76	96.2	7.84	47564	30.85
CLDS Reference	E	02	11/22/2018 10:10:56	11.4	8.69	95.8	7.84	48262	31.36
Composite 2	A	02	11/22/2018 10:11:22	11.3	8.76	96.7	7.89	48500	31.53
Composite 2	B	02	11/22/2018 10:11:49	11.4	8.61	94.8	7.91	47771	31.01
Composite 2	C	02	11/22/2018 10:12:20	11.6	8.74	96.9	7.93	48535	31.57
Composite 2	D	02	11/22/2018 10:12:58	11.4	5.91	64.6	7.76	46364	29.99
Composite 2	E	02	11/22/2018 10:13:53	11.2	8.72	95.2	7.96	46681	30.21
Composite 3	A	02	11/22/2018 10:14:39	11.2	8.06	88.6	7.84	48265	31.36
Composite 3	B	02	11/22/2018 10:15:16	11.1	8.90	97.8	7.95	48492	31.51
Composite 3	C	02	11/22/2018 10:15:46	11.3	8.28	90.9	7.89	47810	31.03
Composite 3	D	02	11/22/2018 10:16:26	11.5	8.01	88.7	7.85	48758	31.72
Composite 3	E	02	11/22/2018 10:16:55	11.5	7.99	88.2	7.83	48049	31.21

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	02	11/22/2018 10:17:27	11.2	8.87	97.1	7.96	47348	30.69
Composite 4	B	02	11/22/2018 10:18:21	11.3	8.68	94.6	7.97	46368	29.99
Composite 4	C	02	11/22/2018 10:18:53	11.5	8.56	94.9	7.91	48895	31.82
Composite 4	D	02	11/22/2018 10:19:21	11.3	8.86	97.9	7.97	48962	31.86
Composite 4	E	02	11/22/2018 10:19:49	11.4	8.52	93.3	7.97	46625	30.18
Composite 5	A	02	11/22/2018 10:20:16	11.5	8.81	97.7	7.91	48892	31.82
Composite 5	B	02	11/22/2018 10:20:44	11.2	8.86	96.7	7.97	46918	30.38
Composite 5	C	02	11/22/2018 10:21:10	11.2	8.95	97.5	8.01	46276	29.92
Composite 5	D	02	11/22/2018 10:21:39	11.5	8.68	96.2	7.93	48915	31.84
Composite 5	E	02	11/22/2018 10:22:02	12.1	8.66	97.1	7.92	48297	31.42
Composite 6	A	02	11/22/2018 10:22:31	11.2	9.11	99.8	7.96	47549	30.84
Composite 6	B	02	11/22/2018 10:23:01	11.1	9.13	98.9	8.02	45663	29.48
Composite 6	C	02	11/22/2018 10:23:32	11.2	9.00	97.7	8.00	45467	29.35
Composite 6	D	02	11/22/2018 10:24:04	11.4	8.39	92.4	7.93	47757	31.00
Composite 6	E	02	11/22/2018 10:24:37	11.4	8.77	96.1	7.95	46530	30.12
Laboratory Control	A	03	11/23/2018 10:15:40	11.8	8.24	90.7	7.82	47781	31.03
Laboratory Control	B	03	11/23/2018 10:16:08	11.7	8.96	98.5	7.84	47739	31.00
Laboratory Control	C	03	11/23/2018 10:16:31	12.0	8.80	97.3	7.85	47423	30.79
Laboratory Control	D	03	11/23/2018 10:16:46	11.8	8.89	98.0	7.85	47855	31.09
Laboratory Control	E	03	11/23/2018 10:17:09	11.9	8.81	97.1	7.85	47549	30.87
CLDS Reference	A	03	11/23/2018 10:17:31	11.7	8.87	97.5	7.85	47714	30.98
CLDS Reference	B	03	11/23/2018 10:17:48	11.7	8.90	97.8	7.85	47615	30.91
CLDS Reference	C	03	11/23/2018 10:18:16	11.7	8.84	97.2	7.85	47629	30.92
CLDS Reference	D	03	11/23/2018 10:18:35	11.6	8.92	97.8	7.85	47515	30.83
CLDS Reference	E	03	11/23/2018 10:18:53	11.5	8.91	97.6	7.85	47662	30.94
Composite 2	A	03	11/23/2018 10:19:15	11.6	8.79	96.3	7.85	47675	30.95
Composite 2	B	03	11/23/2018 10:19:38	11.7	8.78	96.4	7.86	47520	30.84
Composite 2	C	03	11/23/2018 10:20:02	11.5	8.92	97.7	7.88	47807	31.04
Composite 2	D	03	11/23/2018 10:20:36	11.7	7.53	82.5	7.80	46848	30.36
Composite 2	E	03	11/23/2018 10:21:01	11.6	8.76	95.5	7.93	46479	30.09
Composite 3	A	03	11/23/2018 10:21:26	11.7	8.20	90.2	7.84	47585	30.89
Composite 3	B	03	11/23/2018 10:21:47	11.5	8.82	96.5	7.89	47610	30.90
Composite 3	C	03	11/23/2018 10:22:12	11.5	8.54	93.4	7.86	47352	30.71
Composite 3	D	03	11/23/2018 10:22:36	11.6	8.46	92.8	7.83	47745	31.00
Composite 3	E	03	11/23/2018 10:23:00	11.7	8.43	92.7	7.82	47528	30.85
Composite 4	A	03	11/23/2018 10:23:20	11.4	8.92	97.1	7.90	47112	30.53
Composite 4	B	03	11/23/2018 10:23:40	11.3	8.87	95.9	7.93	45957	29.70
Composite 4	C	03	11/23/2018 10:24:00	11.6	8.75	95.9	7.88	47681	30.95
Composite 4	D	03	11/23/2018 10:24:23	11.3	8.99	98.1	7.92	47885	31.09
Composite 4	E	03	11/23/2018 10:24:45	11.4	8.82	95.6	7.96	46062	29.78
Composite 5	A	03	11/23/2018 10:25:12	11.9	8.79	96.8	7.88	47442	30.79
Composite 5	B	03	11/23/2018 10:25:26	11.5	8.89	96.8	7.93	46599	30.17
Composite 5	C	03	11/23/2018 10:25:44	11.5	8.99	97.6	7.99	45725	29.54
Composite 5	D	03	11/23/2018 10:26:08	12.2	8.69	96.1	7.92	46942	30.45
Composite 5	E	03	11/23/2018 10:26:31	12.2	8.67	96.0	7.89	46968	30.46

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	A	03	11/23/2018 10:27:02	11.3	9.10	98.9	7.92	47166	30.57
Composite 6	B	03	11/23/2018 10:27:25	11.2	9.16	98.5	7.99	45096	29.08
Composite 6	C	03	11/23/2018 10:27:41	11.3	9.05	97.5	7.97	45129	29.11
Composite 6	D	03	11/23/2018 10:28:04	11.4	8.61	93.8	7.92	47052	30.49
Composite 6	E	03	11/23/2018 10:28:23	11.4	8.83	95.8	7.93	46233	29.90
Laboratory Control	A	04	11/24/2018 12:55:48	11.4	8.00	88.3	7.83	46855	30.35
Laboratory Control	B	04	11/24/2018 12:56:14	11.6	8.92	98.8	7.86	46439	30.06
Laboratory Control	C	04	11/24/2018 12:56:38	11.5	8.72	96.3	7.84	46465	30.07
Laboratory Control	D	04	11/24/2018 12:56:55	11.8	8.82	97.7	7.86	45777	29.59
Laboratory Control	E	04	11/24/2018 12:57:26	11.3	8.76	96.4	7.84	46692	30.22
CLDS Reference	A	04	11/24/2018 12:57:51	11.6	8.84	97.6	7.86	45725	29.55
CLDS Reference	B	04	11/24/2018 12:58:08	11.6	8.89	98.0	7.87	45279	29.23
CLDS Reference	C	04	11/24/2018 12:58:31	11.5	8.76	96.4	7.87	45360	29.28
CLDS Reference	D	04	11/24/2018 12:58:45	11.6	8.85	97.7	7.86	45527	29.41
CLDS Reference	E	04	11/24/2018 12:59:00	11.3	8.90	97.7	7.86	45917	29.67
Composite 2	A	04	11/24/2018 12:59:24	11.1	8.78	96.5	7.88	46907	30.37
Composite 2	B	04	11/24/2018 12:59:40	11.1	8.73	96.0	7.88	46998	30.44
Composite 2	C	04	11/24/2018 13:00:04	11.4	8.80	97.2	7.90	46685	30.23
Composite 2	D	04	11/24/2018 13:00:31	11.6	7.74	85.4	7.82	45582	29.44
Composite 2	E	04	11/24/2018 13:00:53	11.4	8.73	96.0	7.91	45654	29.49
Composite 3	A	04	11/24/2018 13:01:11	11.4	8.45	93.0	7.85	46055	29.77
Composite 3	B	04	11/24/2018 13:01:35	11.5	8.70	95.9	7.86	45560	29.43
Composite 3	C	04	11/24/2018 13:01:56	11.3	8.52	93.5	7.83	45804	29.59
Composite 3	D	04	11/24/2018 13:02:11	11.6	8.49	93.7	7.83	45702	29.53
Composite 3	E	04	11/24/2018 13:02:37	11.5	8.53	94.0	7.82	45748	29.56
Composite 4	A	04	11/24/2018 13:02:52	11.3	8.79	96.5	7.87	45863	29.63
Composite 4	B	04	11/24/2018 13:03:12	11.2	8.76	95.8	7.90	45596	29.44
Composite 4	C	04	11/24/2018 13:03:33	11.7	8.75	96.7	7.88	45444	29.35
Composite 4	D	04	11/24/2018 13:03:52	11.3	8.87	97.7	7.90	46371	30.00
Composite 4	E	04	11/24/2018 13:04:13	11.4	8.72	95.8	7.93	45603	29.45
Composite 5	A	04	11/24/2018 13:04:44	11.3	8.81	97.0	7.89	46663	30.20
Composite 5	B	04	11/24/2018 13:05:00	11.3	8.79	96.3	7.91	45762	29.56
Composite 5	C	04	11/24/2018 13:05:20	11.3	8.79	96.4	7.96	45378	29.29
Composite 5	D	04	11/24/2018 13:05:33	11.3	8.84	97.2	7.93	45902	29.66
Composite 5	E	04	11/24/2018 13:05:47	11.1	8.85	97.0	7.88	46625	30.17
Composite 6	A	04	11/24/2018 13:06:10	10.9	8.97	97.9	7.91	46487	30.06
Composite 6	B	04	11/24/2018 13:06:33	11.1	9.01	98.0	7.97	45052	29.04
Composite 6	C	04	11/24/2018 13:06:57	11.1	8.87	96.4	7.96	44976	28.99
Composite 6	D	04	11/24/2018 13:07:17	11.4	8.63	95.1	7.92	45993	29.73
Composite 6	E	04	11/24/2018 13:07:39	11.2	8.71	95.3	7.93	45852	29.62
Laboratory Control	A	05	11/25/2018 12:35:45	11.4	7.85	87.7	7.75	47164	30.57
Laboratory Control	B	05	11/25/2018 12:36:40	11.7	8.68	97.2	7.83	46365	30.01
Laboratory Control	C	05	11/25/2018 12:37:10	11.6	8.64	96.5	7.83	46422	30.05
Laboratory Control	D	05	11/25/2018 12:37:35	11.8	8.69	97.5	7.84	46477	30.10

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	E	05	11/25/2018 12:38:06	11.4	8.72	97.2	7.84	46815	30.32
CLDS Reference	A	05	11/25/2018 12:38:53	11.7	8.52	95.3	7.85	46469	30.08
CLDS Reference	B	05	11/25/2018 12:39:21	11.6	8.61	96.2	7.85	46464	30.08
CLDS Reference	C	05	11/25/2018 12:39:50	11.5	8.67	96.6	7.85	46311	29.96
CLDS Reference	D	05	11/25/2018 12:40:17	11.6	8.47	94.7	7.85	46453	30.07
CLDS Reference	E	05	11/25/2018 12:40:54	11.3	8.66	96.1	7.85	46370	30.00
Composite 2	A	05	11/25/2018 12:41:26	11.3	8.50	94.4	7.86	46612	30.17
Composite 2	B	05	11/25/2018 12:41:52	11.2	8.14	90.3	7.87	47053	30.48
Composite 2	C	05	11/25/2018 12:42:36	11.4	8.59	95.6	7.86	46471	30.07
Composite 2	D	05	11/25/2018 12:43:11	11.7	7.74	86.6	7.79	46387	30.02
Composite 2	E	05	11/25/2018 12:43:36	11.5	8.43	94.0	7.83	46323	29.97
Composite 3	A	05	11/25/2018 12:44:07	11.5	7.93	88.4	7.79	46384	30.02
Composite 3	B	05	11/25/2018 12:44:34	11.6	8.38	93.7	7.80	46459	30.08
Composite 3	C	05	11/25/2018 12:45:08	11.5	7.94	88.4	7.79	46331	29.97
Composite 3	D	05	11/25/2018 12:46:31	11.6	8.09	90.3	7.79	46413	30.04
Composite 3	E	05	11/25/2018 12:46:59	11.4	8.34	92.6	7.79	46280	29.93
Composite 4	A	05	11/25/2018 12:47:26	11.4	8.51	94.6	7.83	46355	29.99
Composite 4	B	05	11/25/2018 12:47:59	11.4	8.41	93.5	7.84	46245	29.91
Composite 4	C	05	11/25/2018 12:48:24	11.7	8.49	95.0	7.83	46497	30.10
Composite 4	D	05	11/25/2018 12:48:50	11.5	8.53	95.0	7.84	46434	30.05
Composite 4	E	05	11/25/2018 12:49:28	11.4	8.22	91.2	7.84	46234	29.90
Composite 5	A	05	11/25/2018 12:50:45	11.3	8.66	96.2	7.86	46719	30.25
Composite 5	B	05	11/25/2018 12:51:09	11.4	8.32	92.4	7.85	46225	29.89
Composite 5	C	05	11/25/2018 12:51:43	11.4	8.45	93.9	7.86	46166	29.85
Composite 5	D	05	11/25/2018 12:52:08	11.4	8.52	94.7	7.84	46347	29.98
Composite 5	E	05	11/25/2018 12:52:49	11.1	8.27	91.7	7.83	46924	30.39
Composite 6	A	05	11/25/2018 12:53:20	11.0	9.12	100.9	7.90	47074	30.49
Composite 6	B	05	11/25/2018 12:54:12	11.0	9.14	100.6	7.95	45839	29.60
Composite 6	C	05	11/25/2018 12:54:38	11.2	8.69	96.0	7.93	45846	29.62
Composite 6	D	05	11/25/2018 12:55:11	11.5	8.36	93.1	7.88	46361	30.00
Composite 6	E	05	11/25/2018 12:55:37	11.3	8.60	95.4	7.91	46340	29.97
Laboratory Control	A	06	11/26/2018 12:19:25	11.4	7.82	87.0	7.72	47438	30.77
Laboratory Control	B	06	11/26/2018 12:19:53	11.6	8.29	92.1	7.72	46635	30.20
Laboratory Control	C	06	11/26/2018 12:25:07	11.5	8.27	91.8	7.71	46747	30.27
Laboratory Control	D	06	11/26/2018 12:25:34	11.4	6.27	69.5	7.65	46749	30.27
Laboratory Control	E	06	11/26/2018 12:26:03	11.3	8.57	94.9	7.71	47058	30.49
CLDS Reference	A	06	11/26/2018 12:26:27	11.2	8.45	93.2	7.72	46765	30.27
CLDS Reference	B	06	11/26/2018 12:27:01	11.1	8.59	94.7	7.74	46821	30.31
CLDS Reference	C	06	11/26/2018 12:27:24	11.1	8.76	96.5	7.76	46775	30.28
CLDS Reference	D	06	11/26/2018 12:27:52	11.1	7.63	84.1	7.71	46749	30.26
CLDS Reference	E	06	11/26/2018 12:28:15	11.1	8.23	90.6	7.72	46714	30.23
Composite 2	A	06	11/26/2018 12:28:40	11.2	8.14	89.9	7.72	46936	30.40
Composite 2	B	06	11/26/2018 12:29:07	11.1	6.88	76.0	7.70	47333	30.68
Composite 2	C	06	11/26/2018 12:29:31	11.2	8.21	90.6	7.72	46814	30.31
Composite 2	D	06	11/26/2018 12:30:00	11.4	7.55	83.7	7.67	46683	30.22

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	E	06	11/26/2018 12:30:22	11.3	7.55	83.6	7.69	46763	30.28
Composite 3	A	06	11/26/2018 12:30:46	11.3	7.20	79.7	7.66	46809	30.31
Composite 3	B	06	11/26/2018 12:31:11	11.2	8.04	88.8	7.67	46798	30.30
Composite 3	C	06	11/26/2018 12:31:40	11.2	6.35	70.1	7.62	46726	30.24
Composite 3	D	06	11/26/2018 12:32:05	11.1	6.47	71.3	7.61	46730	30.24
Composite 3	E	06	11/26/2018 12:32:58	11.0	3.74	41.1	7.52	46563	30.12
Composite 4	A	06	11/26/2018 12:33:27	11.1	7.96	87.8	7.64	46778	30.28
Composite 4	B	06	11/26/2018 12:33:52	11.1	7.50	82.6	7.65	46627	30.17
Composite 4	C	06	11/26/2018 12:34:15	11.1	7.97	87.8	7.66	46823	30.31
Composite 4	D	06	11/26/2018 12:34:38	11.2	7.70	85.1	7.67	46824	30.32
Composite 4	E	06	11/26/2018 12:35:00	11.2	7.96	87.9	7.69	46642	30.19
Composite 5	A	06	11/26/2018 12:35:33	11.3	8.91	98.8	7.76	47006	30.45
Composite 5	B	06	11/26/2018 12:36:07	11.2	8.17	90.3	7.71	46723	30.25
Composite 5	C	06	11/26/2018 12:36:31	11.2	7.79	85.9	7.71	46488	30.07
Composite 5	D	06	11/26/2018 12:36:51	11.1	8.02	88.5	7.69	46751	30.26
Composite 5	E	06	11/26/2018 12:37:20	11.1	6.32	69.7	7.62	47178	30.56
Composite 6	A	06	11/26/2018 12:38:00	10.9	9.19	101.1	7.78	47325	30.66
Composite 6	B	06	11/26/2018 12:38:22	10.9	9.27	101.4	7.86	46085	29.77
Composite 6	C	06	11/26/2018 12:38:49	11.1	8.07	88.9	7.79	46425	30.03
Composite 6	D	06	11/26/2018 12:39:23	11.2	8.35	92.2	7.77	46731	30.25
Composite 6	E	06	11/26/2018 12:39:47	11.2	8.44	93.1	7.80	46670	30.20
Laboratory Control	A	07	11/27/2018 10:04:12	11.4	7.69	87.7	7.78	46861	30.35
Laboratory Control	B	07	11/27/2018 10:04:39	11.6	8.35	95.3	7.81	46303	29.96
Laboratory Control	C	07	11/27/2018 10:05:02	11.4	8.27	94.0	7.80	46287	29.94
Laboratory Control	D	07	11/27/2018 10:05:39	11.4	5.16	58.5	7.64	46148	29.84
Laboratory Control	E	07	11/27/2018 10:06:07	11.3	8.32	94.3	7.76	46448	30.05
CLDS Reference	A	07	11/27/2018 10:06:26	11.1	8.28	93.5	7.78	46163	29.84
CLDS Reference	B	07	11/27/2018 10:06:48	11.1	8.42	95.1	7.80	46300	29.94
CLDS Reference	C	07	11/27/2018 10:07:12	11.1	8.44	95.4	7.82	46306	29.94
CLDS Reference	D	07	11/27/2018 10:07:38	11.1	8.02	90.6	7.80	46341	29.97
CLDS Reference	E	07	11/27/2018 10:07:59	11.1	8.00	90.3	7.79	46156	29.83
Composite 2	A	07	11/27/2018 10:08:23	11.2	7.97	90.2	7.78	46472	30.06
Composite 2	B	07	11/27/2018 10:08:50	11.1	6.43	72.7	7.73	46729	30.24
Composite 2	C	07	11/27/2018 10:09:41	11.2	8.06	91.2	7.80	46245	29.90
Composite 2	D	07	11/27/2018 10:10:10	11.4	7.34	83.3	7.75	46090	29.80
Composite 2	E	07	11/27/2018 10:10:45	11.3	8.02	90.9	7.79	46385	30.01
Composite 3	A	07	11/27/2018 10:11:10	11.2	6.52	73.8	7.72	46363	29.99
Composite 3	B	07	11/27/2018 10:11:36	11.1	7.83	88.4	7.74	46252	29.90
Composite 3	C	07	11/27/2018 10:12:18	11.1	5.84	65.9	7.66	46251	29.90
Composite 3	D	07	11/27/2018 10:12:45	11.1	5.76	64.9	7.61	46111	29.80
Composite 3	E	07	11/27/2018 10:13:13	11.0	7.05	79.3	7.64	45954	29.68
Composite 4	A	07	11/27/2018 10:13:37	11.1	7.99	90.3	7.72	46373	29.99
Composite 4	B	07	11/27/2018 10:14:01	11.1	7.38	83.2	7.72	46110	29.80
Composite 4	C	07	11/27/2018 10:14:26	11.0	7.76	87.4	7.72	46204	29.86
Composite 4	D	07	11/27/2018 10:14:51	11.1	7.59	85.7	7.72	46340	29.97

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	E	07	11/27/2018 10:15:08	11.2	7.83	88.5	7.75	46127	29.82
Composite 5	A	07	11/27/2018 10:15:40	11.3	8.66	98.3	7.83	46483	30.08
Composite 5	B	07	11/27/2018 10:16:03	11.2	7.96	90.0	7.78	46255	29.91
Composite 5	C	07	11/27/2018 10:16:28	11.1	7.80	88.0	7.78	45895	29.65
Composite 5	D	07	11/27/2018 10:16:47	11.1	8.19	92.5	7.77	46223	29.88
Composite 5	E	07	11/27/2018 10:17:13	11.1	5.82	65.8	7.66	46560	30.12
Composite 6	A	07	11/27/2018 10:17:55	10.9	8.99	101.3	7.92	46737	30.24
Composite 6	B	07	11/27/2018 10:18:25	10.9	9.04	101.2	8.00	45483	29.34
Composite 6	C	07	11/27/2018 10:18:51	11.1	8.02	90.5	7.88	46087	29.78
Composite 6	D	07	11/27/2018 10:19:18	11.2	8.23	92.9	7.86	46214	29.88
Composite 6	E	07	11/27/2018 10:19:43	11.1	8.09	91.3	7.86	46052	29.76
Laboratory Control	A	08	11/28/2018 13:33:30	11.5	8.14	90.3	7.78	41313	26.41
Laboratory Control	B	08	11/28/2018 13:34:14	11.9	8.91	99.8	7.83	41455	26.52
Laboratory Control	C	08	11/28/2018 13:34:49	11.7	8.82	98.4	7.84	41523	26.56
Laboratory Control	D	08	11/28/2018 13:35:16	11.8	9.02	100.8	7.85	41493	26.55
Laboratory Control	E	08	11/28/2018 13:36:01	11.6	8.91	99.1	7.86	41471	26.52
CLDS Reference	A	08	11/28/2018 13:36:39	11.7	8.79	97.8	7.85	41330	26.42
CLDS Reference	B	08	11/28/2018 13:37:19	11.6	8.69	96.6	7.85	41334	26.42
CLDS Reference	C	08	11/28/2018 13:37:57	11.5	8.79	97.5	7.85	41218	26.34
CLDS Reference	D	08	11/28/2018 13:38:53	11.7	8.53	94.9	7.83	41278	26.39
CLDS Reference	E	08	11/28/2018 13:39:21	11.8	8.71	97.2	7.83	41265	26.38
Composite 2	A	08	11/28/2018 13:40:14	11.6	8.44	93.9	7.82	41370	26.45
Composite 2	B	08	11/28/2018 13:40:44	11.4	7.90	87.4	7.80	41205	26.33
Composite 2	C	08	11/28/2018 13:41:24	11.7	8.72	97.1	7.84	41219	26.35
Composite 2	D	08	11/28/2018 13:42:06	11.8	8.47	94.5	7.83	41239	26.36
Composite 2	E	08	11/28/2018 13:42:40	11.6	8.46	94.2	7.82	41408	26.48
Composite 3	A	08	11/28/2018 13:43:36	11.7	7.56	84.2	7.75	41355	26.44
Composite 3	B	08	11/28/2018 13:44:41	11.5	8.57	95.1	7.80	41171	26.31
Composite 3	C	08	11/28/2018 13:45:32	11.3	7.71	85.0	7.73	40972	26.16
Composite 3	D	08	11/28/2018 13:46:35	11.6	8.01	88.9	7.73	41099	26.26
Composite 3	E	08	11/28/2018 13:47:16	11.1	7.61	83.3	7.70	40345	25.71
Composite 4	A	08	11/28/2018 13:47:54	11.2	8.40	92.6	7.76	41148	26.28
Composite 4	B	08	11/28/2018 13:48:17	11.1	8.17	89.7	7.76	40556	25.86
Composite 4	C	08	11/28/2018 13:48:50	11.1	7.90	86.7	7.74	40572	25.87
Composite 4	D	08	11/28/2018 13:49:23	11.2	8.32	91.7	7.76	40978	26.16
Composite 4	E	08	11/28/2018 13:49:48	11.2	8.18	89.9	7.78	40546	25.86
Composite 5	A	08	11/28/2018 13:50:43	11.7	8.88	99.1	7.83	41459	26.52
Composite 5	B	08	11/28/2018 13:51:21	11.7	8.47	94.4	7.80	41355	26.44
Composite 5	C	08	11/28/2018 13:51:54	11.6	8.58	95.4	7.81	41034	26.21
Composite 5	D	08	11/28/2018 13:52:29	11.6	8.56	95.2	7.80	41259	26.37
Composite 5	E	08	11/28/2018 13:52:37	11.6	9.31	95.2	7.80	22060	13.29
Composite 6	A	08	11/28/2018 13:53:28	11.4	9.10	100.6	7.88	41301	26.39
Composite 6	B	08	11/28/2018 13:54:46	11.7	9.06	100.7	7.93	41081	26.25
Composite 6	C	08	11/28/2018 13:55:29	11.4	8.44	93.3	7.85	40898	26.11
Composite 6	D	08	11/28/2018 13:55:59	11.5	8.59	95.3	7.85	41074	26.24

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	E	08	11/28/2018 13:56:27	11.6	8.65	96.1	7.86	41017	26.20
Laboratory Control	A	09	11/29/2018 11:25:31	11.4	7.87	88.0	7.79	47125	30.54
Laboratory Control	B	09	11/29/2018 11:25:58	11.7	8.45	95.1	7.81	46778	30.31
Laboratory Control	C	09	11/29/2018 11:26:19	11.5	8.44	94.6	7.82	46921	30.40
Laboratory Control	D	09	11/29/2018 11:26:36	11.3	8.65	96.6	7.83	47066	30.50
Laboratory Control	E	09	11/29/2018 11:26:58	11.3	8.68	97.0	7.84	46940	30.40
CLDS Reference	A	09	11/29/2018 11:27:14	11.1	8.64	96.2	7.83	47164	30.55
CLDS Reference	B	09	11/29/2018 11:27:33	11.2	8.46	94.2	7.83	46778	30.29
CLDS Reference	C	09	11/29/2018 11:28:00	11.5	8.45	94.7	7.83	46792	30.31
CLDS Reference	D	09	11/29/2018 11:28:55	11.6	8.37	94.0	7.83	46745	30.28
CLDS Reference	E	09	11/29/2018 11:29:37	11.5	8.29	93.0	7.82	46839	30.34
Composite 2	A	09	11/29/2018 11:29:55	11.6	8.33	93.6	7.82	46773	30.30
Composite 2	B	09	11/29/2018 11:30:23	11.4	8.00	89.6	7.80	46917	30.39
Composite 2	C	09	11/29/2018 11:30:51	11.6	8.53	95.8	7.82	46728	30.27
Composite 2	D	09	11/29/2018 11:31:19	11.4	8.38	93.8	7.81	46874	30.36
Composite 2	E	09	11/29/2018 11:31:41	11.2	7.98	89.0	7.79	47102	30.52
Composite 3	A	09	11/29/2018 11:32:06	11.3	7.73	86.4	7.74	46947	30.41
Composite 3	B	09	11/29/2018 11:32:32	11.4	7.91	88.4	7.76	46848	30.34
Composite 3	C	09	11/29/2018 11:32:54	11.4	8.13	90.9	7.77	46754	30.28
Composite 3	D	09	11/29/2018 11:33:15	11.1	7.57	84.2	7.74	46970	30.42
Composite 3	E	09	11/29/2018 11:33:42	11.4	8.26	92.4	7.77	46701	30.24
Composite 4	A	09	11/29/2018 11:34:00	11.5	8.37	93.7	7.78	46557	30.14
Composite 4	B	09	11/29/2018 11:34:32	11.2	8.14	90.7	7.77	46640	30.19
Composite 4	C	09	11/29/2018 11:34:52	11.5	8.42	94.4	7.79	46717	30.25
Composite 4	D	09	11/29/2018 11:35:13	11.2	8.18	91.2	7.78	46953	30.41
Composite 4	E	09	11/29/2018 11:35:42	11.5	8.38	93.8	7.80	46741	30.27
Composite 5	A	09	11/29/2018 11:36:13	11.6	8.58	96.2	7.82	46675	30.23
Composite 5	B	09	11/29/2018 11:36:37	11.5	8.01	89.7	7.80	46766	30.29
Composite 5	C	09	11/29/2018 11:36:56	11.4	8.12	90.8	7.79	46917	30.39
Composite 5	D	09	11/29/2018 11:37:19	11.6	8.35	93.7	7.80	46698	30.24
Composite 5	E	09	11/29/2018 11:37:44	11.2	7.39	82.5	7.74	47017	30.46
Composite 6	A	09	11/29/2018 11:38:12	11.0	8.82	98.0	7.84	47125	30.52
Composite 6	B	09	11/29/2018 11:38:37	11.0	8.93	99.1	7.89	46867	30.34
Composite 6	C	09	11/29/2018 11:38:51	11.2	8.59	95.7	7.86	46870	30.35
Composite 6	D	09	11/29/2018 11:39:05	11.5	8.31	93.1	7.84	46843	30.34
Composite 6	E	09	11/29/2018 11:39:27	11.6	8.40	94.4	7.84	46713	30.26
Laboratory Control	A	10	11/30/2018 15:20:48	11.2	8.08	89.7	7.72	48360	31.42
Laboratory Control	B	10	11/30/2018 15:21:37	11.5	8.74	97.2	7.75	47683	30.95
Laboratory Control	C	10	11/30/2018 15:21:56	11.3	8.75	96.9	7.75	47902	31.10
Laboratory Control	D	10	11/30/2018 15:22:11	11.1	8.88	98.1	7.76	48209	31.31
Laboratory Control	E	10	11/30/2018 15:22:28	11.0	8.96	98.8	7.77	48050	31.19
CLDS Reference	A	10	11/30/2018 15:22:54	10.9	8.61	95.0	7.74	48531	31.53
CLDS Reference	B	10	11/30/2018 15:23:12	11.2	8.62	95.3	7.75	47742	30.97
CLDS Reference	C	10	11/30/2018 15:23:50	11.4	8.60	95.5	7.77	47727	30.98

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
CLDS Reference	D	10	11/30/2018 15:24:13	11.5	8.54	95.0	7.77	47682	30.95
CLDS Reference	E	10	11/30/2018 15:24:39	11.4	8.67	96.3	7.76	47770	31.01
Composite 2	A	10	11/30/2018 15:25:03	11.5	8.36	93.0	7.75	47696	30.96
Composite 2	B	10	11/30/2018 15:25:21	11.3	8.15	90.4	7.73	47943	31.12
Composite 2	C	10	11/30/2018 15:25:44	11.3	8.72	96.8	7.75	47757	30.99
Composite 2	D	10	11/30/2018 15:26:13	11.2	8.54	94.5	7.74	47956	31.13
Composite 2	E	10	11/30/2018 15:26:33	11.1	8.36	92.4	7.73	48153	31.27
Composite 3	A	10	11/30/2018 15:26:53	11.1	5.24	58.0	7.62	47891	31.08
Composite 3	B	10	11/30/2018 15:27:21	11.1	8.20	90.6	7.67	47857	31.06
Composite 3	C	10	11/30/2018 15:27:47	11.2	8.04	89.0	7.69	47719	30.96
Composite 3	D	10	11/30/2018 15:28:10	11.0	6.43	70.9	7.62	48351	31.40
Composite 3	E	10	11/30/2018 15:28:37	11.2	8.43	93.4	7.68	47764	30.99
Composite 4	A	10	11/30/2018 15:29:01	11.5	8.55	95.1	7.72	47654	30.93
Composite 4	B	10	11/30/2018 15:29:37	11.1	8.14	89.9	7.70	48001	31.16
Composite 4	C	10	11/30/2018 15:29:58	11.4	8.49	94.3	7.72	47713	30.96
Composite 4	D	10	11/30/2018 15:30:22	11.1	8.04	89.0	7.69	48326	31.39
Composite 4	E	10	11/30/2018 15:30:50	11.4	8.54	94.9	7.73	47748	30.99
Composite 5	A	10	11/30/2018 15:31:16	11.3	8.81	97.7	7.75	47689	30.95
Composite 5	B	10	11/30/2018 15:31:38	11.2	8.38	92.8	7.73	47730	30.97
Composite 5	C	10	11/30/2018 15:32:01	11.1	8.37	92.6	7.73	48073	31.21
Composite 5	D	10	11/30/2018 15:32:25	11.4	8.49	94.2	7.74	47662	30.93
Composite 5	E	10	11/30/2018 15:32:48	11.1	6.38	70.5	7.63	48404	31.45
Composite 6	A	10	11/30/2018 15:33:27	10.9	9.01	99.2	7.75	48455	31.47
Composite 6	B	10	11/30/2018 15:33:45	10.9	9.07	99.9	7.80	48258	31.33
Composite 6	C	10	11/30/2018 15:34:05	11.1	8.52	94.1	7.77	48163	31.27
Composite 6	D	10	11/30/2018 15:34:27	11.4	8.51	94.5	7.76	47787	31.02
Composite 6	E	10	11/30/2018 15:34:51	11.5	8.56	95.3	7.77	47654	30.93
Laboratory Control	A	11	12/1/2018 11:02:29	11.4	8.74	94.9	7.79	44219	28.46
Laboratory Control	B	11	12/1/2018 11:02:57	11.6	9.10	98.9	7.80	43367	27.86
Laboratory Control	C	11	12/1/2018 11:03:21	11.5	9.27	100.7	7.80	43411	27.89
Laboratory Control	D	11	12/1/2018 11:03:44	11.7	9.37	101.8	7.81	42656	27.36
Laboratory Control	E	11	12/1/2018 11:05:54	11.5	9.26	100.3	7.82	43205	27.74
CLDS Reference	A	11	12/1/2018 11:06:21	11.7	9.29	100.9	7.82	42618	27.34
CLDS Reference	B	11	12/1/2018 11:06:41	11.3	9.24	99.8	7.81	43223	27.75
CLDS Reference	C	11	12/1/2018 11:07:08	11.5	9.20	99.7	7.82	43218	27.75
CLDS Reference	D	11	12/1/2018 11:07:36	11.6	9.00	97.7	7.81	43064	27.65
CLDS Reference	E	11	12/1/2018 11:07:53	11.6	9.11	98.9	7.81	42972	27.58
Composite 2	A	11	12/1/2018 11:08:06	11.6	9.14	99.3	7.81	43062	27.65
Composite 2	B	11	12/1/2018 11:08:57	11.4	8.58	92.9	7.77	43525	27.97
Composite 2	C	11	12/1/2018 11:09:23	11.5	9.17	99.5	7.80	43160	27.71
Composite 2	D	11	12/1/2018 11:09:59	11.6	9.04	98.1	7.80	42879	27.52
Composite 2	E	11	12/1/2018 11:10:32	11.5	9.56	103.6	7.83	42854	27.50
Composite 3	A	11	12/1/2018 11:11:04	11.5	8.81	95.6	7.79	43237	27.77
Composite 3	B	11	12/1/2018 11:11:33	11.4	8.87	96.1	7.78	43368	27.86
Composite 3	C	11	12/1/2018 11:11:59	11.3	8.94	96.6	7.79	43458	27.92

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 3	D	11	12/1/2018 11:12:19	11.2	9.38	101.4	7.81	44080	28.35
Composite 3	E	11	12/1/2018 11:12:56	11.3	8.92	96.6	7.79	43965	28.28
Composite 4	A	11	12/1/2018 11:13:21	11.5	9.10	98.7	7.79	43128	27.69
Composite 4	B	11	12/1/2018 11:13:48	11.5	8.87	96.3	7.79	43491	27.95
Composite 4	C	11	12/1/2018 11:14:24	11.5	8.84	95.9	7.79	43304	27.82
Composite 4	D	11	12/1/2018 11:14:55	11.3	8.86	96.2	7.78	43979	28.29
Composite 4	E	11	12/1/2018 11:15:22	11.6	9.09	98.7	7.80	42784	27.45
Composite 5	A	11	12/1/2018 11:15:49	11.5	9.24	100.2	7.80	43064	27.65
Composite 5	B	11	12/1/2018 11:16:14	11.5	8.77	95.2	7.78	43343	27.84
Composite 5	C	11	12/1/2018 11:16:44	11.7	9.01	97.9	7.80	42800	27.47
Composite 5	D	11	12/1/2018 11:17:08	11.6	8.97	97.4	7.79	43136	27.70
Composite 5	E	11	12/1/2018 11:17:26	11.5	8.87	96.2	7.78	43238	27.77
Composite 6	A	11	12/1/2018 11:18:00	11.2	9.38	101.5	7.81	44063	28.34
Composite 6	B	11	12/1/2018 11:18:25	11.3	9.40	101.7	7.83	43468	27.92
Composite 6	C	11	12/1/2018 11:18:50	11.2	8.79	95.5	7.78	45265	29.20
Composite 6	D	11	12/1/2018 11:19:11	11.7	8.98	97.7	7.81	42980	27.59
Composite 6	E	11	12/1/2018 11:19:32	11.7	9.16	99.7	7.81	42764	27.44
Laboratory Control	A	12	12/2/2018 13:05:06	11.4	8.56	94.3	7.78	44319	28.53
Laboratory Control	B	12	12/2/2018 13:05:38	11.5	9.18	101.5	7.82	44071	28.36
Laboratory Control	C	12	12/2/2018 13:05:59	11.5	9.27	102.5	7.83	44172	28.43
Laboratory Control	D	12	12/2/2018 13:06:17	11.7	9.27	102.9	7.85	44309	28.54
Laboratory Control	E	12	12/2/2018 13:06:43	11.4	9.41	103.7	7.86	44202	28.45
CLDS Reference	A	12	12/2/2018 13:07:13	11.7	9.24	102.5	7.87	44321	28.55
CLDS Reference	B	12	12/2/2018 13:07:38	11.3	9.21	101.4	7.86	44300	28.52
CLDS Reference	C	12	12/2/2018 13:07:59	11.4	9.25	101.9	7.86	44187	28.44
CLDS Reference	D	12	12/2/2018 13:08:25	11.5	9.01	99.5	7.85	44238	28.48
CLDS Reference	E	12	12/2/2018 13:08:49	11.6	9.10	100.8	7.85	44285	28.52
Composite 2	A	12	12/2/2018 13:09:14	11.5	8.95	99.0	7.85	44286	28.52
Composite 2	B	12	12/2/2018 13:09:38	11.2	8.45	92.5	7.80	43879	28.21
Composite 2	C	12	12/2/2018 13:10:01	11.5	9.07	100.2	7.84	44280	28.51
Composite 2	D	12	12/2/2018 13:10:27	11.5	9.07	100.4	7.84	44304	28.53
Composite 2	E	12	12/2/2018 13:10:47	11.4	8.86	97.7	7.83	44333	28.54
Composite 3	A	12	12/2/2018 13:11:13	11.4	8.96	98.9	7.83	44240	28.48
Composite 3	B	12	12/2/2018 13:11:36	11.3	8.96	98.7	7.83	44207	28.45
Composite 3	C	12	12/2/2018 13:11:54	11.3	9.12	100.4	7.83	44375	28.57
Composite 3	D	12	12/2/2018 13:12:20	11.2	8.10	88.9	7.77	44395	28.58
Composite 3	E	12	12/2/2018 13:12:47	11.2	8.85	97.2	7.79	44211	28.45
Composite 4	A	12	12/2/2018 13:13:12	11.6	8.95	99.0	7.82	44274	28.51
Composite 4	B	12	12/2/2018 13:13:36	11.5	8.99	99.4	7.82	44231	28.48
Composite 4	C	12	12/2/2018 13:13:59	11.4	8.99	99.2	7.83	44247	28.48
Composite 4	D	12	12/2/2018 13:14:24	11.2	8.82	96.8	7.80	44175	28.42
Composite 4	E	12	12/2/2018 13:14:48	11.6	9.01	99.9	7.83	44327	28.55
Composite 5	A	12	12/2/2018 13:15:20	11.3	9.07	99.9	7.84	44286	28.51
Composite 5	B	12	12/2/2018 13:15:48	11.4	8.83	97.4	7.82	44162	28.42
Composite 5	C	12	12/2/2018 13:16:14	11.6	8.98	99.4	7.84	44252	28.49

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	D	12	12/2/2018 13:16:39	11.4	8.91	98.3	7.83	44186	28.44
Composite 5	E	12	12/2/2018 13:16:57	11.4	8.69	95.9	7.82	44204	28.45
Composite 6	A	12	12/2/2018 13:17:23	11.2	9.39	103.2	7.87	44311	28.52
Composite 6	B	12	12/2/2018 13:17:50	11.2	9.45	103.7	7.90	44117	28.38
Composite 6	C	12	12/2/2018 13:18:18	11.2	8.81	97.1	7.83	45320	29.24
Composite 6	D	12	12/2/2018 13:18:42	11.6	8.98	99.6	7.85	44252	28.50
Composite 6	E	12	12/2/2018 13:19:08	11.7	9.05	100.5	7.86	44294	28.53
Laboratory Control	A	13	12/3/2018 12:13:04	11.5	8.17	92.2	7.80	47024	30.47
Laboratory Control	B	13	12/3/2018 12:13:34	11.5	8.85	99.9	7.82	46801	30.31
Laboratory Control	C	13	12/3/2018 12:13:58	11.4	8.89	100.2	7.83	46845	30.34
Laboratory Control	D	13	12/3/2018 12:14:13	11.2	8.95	100.6	7.83	47043	30.48
Laboratory Control	E	13	12/3/2018 12:14:31	11.2	9.07	101.6	7.85	46881	30.36
CLDS Reference	A	13	12/3/2018 12:14:48	11.1	8.77	98.1	7.82	47079	30.49
CLDS Reference	B	13	12/3/2018 12:15:04	11.0	8.65	96.7	7.82	46967	30.41
CLDS Reference	C	13	12/3/2018 12:15:27	11.3	8.77	98.6	7.84	46876	30.36
CLDS Reference	D	13	12/3/2018 12:15:51	11.4	8.39	94.7	7.83	46861	30.36
CLDS Reference	E	13	12/3/2018 12:16:11	11.5	8.54	96.4	7.84	46817	30.33
Composite 2	A	13	12/3/2018 12:16:34	11.5	8.19	92.5	7.84	46880	30.37
Composite 2	B	13	12/3/2018 12:17:11	11.3	7.37	82.8	7.77	46706	30.24
Composite 2	C	13	12/3/2018 12:17:36	11.4	8.68	97.8	7.83	46935	30.40
Composite 2	D	13	12/3/2018 12:18:03	11.5	8.36	94.3	7.81	46895	30.38
Composite 2	E	13	12/3/2018 12:18:22	11.4	8.17	92.1	7.82	46887	30.37
Composite 3	A	13	12/3/2018 12:18:41	11.3	8.27	93.0	7.80	46868	30.35
Composite 3	B	13	12/3/2018 12:19:07	11.3	8.50	95.5	7.81	46879	30.36
Composite 3	C	13	12/3/2018 12:19:27	11.2	8.62	96.8	7.81	47003	30.45
Composite 3	D	13	12/3/2018 12:19:56	11.2	6.41	71.9	7.71	47060	30.48
Composite 3	E	13	12/3/2018 12:20:35	11.2	8.48	95.2	7.76	46915	30.38
Composite 4	A	13	12/3/2018 12:21:04	11.5	8.37	94.5	7.80	46854	30.35
Composite 4	B	13	12/3/2018 12:21:29	11.5	8.38	94.5	7.81	46796	30.31
Composite 4	C	13	12/3/2018 12:21:58	11.4	8.50	95.8	7.81	46878	30.37
Composite 4	D	13	12/3/2018 12:22:14	11.3	8.35	93.8	7.78	46902	30.38
Composite 4	E	13	12/3/2018 12:22:39	11.5	8.56	96.7	7.82	46879	30.37
Composite 5	A	13	12/3/2018 12:23:12	11.4	8.69	97.8	7.82	46982	30.44
Composite 5	B	13	12/3/2018 12:23:38	11.4	8.13	91.6	7.82	46822	30.33
Composite 5	C	13	12/3/2018 12:24:04	11.5	8.33	93.9	7.84	46826	30.33
Composite 5	D	13	12/3/2018 12:24:29	11.4	8.42	94.8	7.84	46830	30.33
Composite 5	E	13	12/3/2018 12:24:54	11.3	7.97	89.7	7.82	46852	30.34
Composite 6	A	13	12/3/2018 12:25:21	11.2	9.15	102.7	7.85	46994	30.44
Composite 6	B	13	12/3/2018 12:25:44	11.2	9.21	103.2	7.87	46872	30.35
Composite 6	C	13	12/3/2018 12:26:10	11.3	8.59	97.0	7.82	48083	31.23
Composite 6	D	13	12/3/2018 12:26:34	11.6	8.36	94.6	7.84	46824	30.34
Composite 6	E	13	12/3/2018 12:26:59	11.6	8.40	94.9	7.85	46849	30.35
Laboratory Control	A	14	12/4/2018 10:01:07	11.3	8.05	89.1	7.75	46429	30.04
Laboratory Control	B	14	12/4/2018 10:01:37	11.3	8.70	96.3	7.77	46043	29.76

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	C	14	12/4/2018 10:02:01	11.2	8.62	95.4	7.78	46262	29.92
Laboratory Control	D	14	12/4/2018 10:02:26	11.1	8.77	96.7	7.80	46243	29.89
Laboratory Control	E	14	12/4/2018 10:02:52	11.1	8.94	98.4	7.82	46247	29.90
CLDS Reference	A	14	12/4/2018 10:03:12	11.0	8.64	94.9	7.80	46284	29.92
CLDS Reference	B	14	12/4/2018 10:03:39	10.9	8.45	92.8	7.78	46303	29.93
CLDS Reference	C	14	12/4/2018 10:04:04	11.1	8.76	96.5	7.80	46410	30.01
CLDS Reference	D	14	12/4/2018 10:04:30	11.1	8.18	90.2	7.77	46262	29.91
CLDS Reference	E	14	12/4/2018 10:04:55	11.2	8.49	93.8	7.78	46487	30.07
Composite 2	A	14	12/4/2018 10:05:19	11.1	8.21	90.5	7.79	46338	29.96
Composite 2	B	14	12/4/2018 10:05:43	11.1	6.72	73.9	7.72	45972	29.70
Composite 2	C	14	12/4/2018 10:06:11	11.3	8.60	95.4	7.79	46567	30.14
Composite 2	D	14	12/4/2018 10:06:46	11.2	8.29	91.6	7.77	46327	29.96
Composite 2	E	14	12/4/2018 10:07:13	11.2	7.79	86.1	7.75	46506	30.09
Composite 3	A	14	12/4/2018 10:07:41	11.1	8.08	89.2	7.72	46349	29.97
Composite 3	B	14	12/4/2018 10:08:13	11.0	8.25	90.6	7.75	46085	29.77
Composite 3	C	14	12/4/2018 10:08:42	11.1	6.52	71.9	7.67	46501	30.08
Composite 3	D	14	12/4/2018 10:09:14	11.0	4.86	53.4	7.58	46284	29.92
Composite 3	E	14	12/4/2018 10:09:50	11.0	8.42	92.7	7.70	46281	29.92
Composite 4	A	14	12/4/2018 10:10:12	11.0	8.35	91.9	7.72	46195	29.86
Composite 4	B	14	12/4/2018 10:10:35	11.1	8.07	88.9	7.72	46204	29.87
Composite 4	C	14	12/4/2018 10:10:53	11.0	8.34	91.8	7.73	46166	29.84
Composite 4	D	14	12/4/2018 10:11:15	11.1	8.09	89.2	7.71	46201	29.86
Composite 4	E	14	12/4/2018 10:11:37	11.3	8.55	94.7	7.75	46507	30.09
Composite 5	A	14	12/4/2018 10:12:11	11.1	8.61	95.0	7.78	46198	29.86
Composite 5	B	14	12/4/2018 10:12:37	11.1	7.48	82.4	7.74	46099	29.79
Composite 5	C	14	12/4/2018 10:13:01	11.1	8.09	89.3	7.77	46315	29.95
Composite 5	D	14	12/4/2018 10:13:27	11.1	8.28	91.1	7.79	46122	29.81
Composite 5	E	14	12/4/2018 10:13:54	11.1	7.08	78.0	7.74	46229	29.88
Composite 6	A	14	12/4/2018 10:14:23	10.9	9.07	99.7	7.81	46323	29.94
Composite 6	B	14	12/4/2018 10:14:46	10.9	9.11	100.0	7.83	46194	29.85
Composite 6	C	14	12/4/2018 10:15:11	11.1	8.53	94.4	7.80	47254	30.62
Composite 6	D	14	12/4/2018 10:15:36	11.2	7.95	87.8	7.78	46258	29.91
Composite 6	E	14	12/4/2018 10:16:00	11.2	8.21	90.6	7.78	46204	29.87
Laboratory Control	A	15	12/5/2018 10:12:21	11.3	8.18	89.8	7.76	46342	29.98
Laboratory Control	B	15	12/5/2018 10:12:53	11.4	8.85	97.1	7.79	45789	29.58
Laboratory Control	C	15	12/5/2018 10:13:18	11.4	8.82	97.1	7.80	46519	30.11
Laboratory Control	D	15	12/5/2018 10:13:33	11.1	8.90	96.9	7.80	45336	29.25
Laboratory Control	E	15	12/5/2018 10:13:59	11.3	8.87	97.3	7.81	46467	30.06
CLDS Reference	A	15	12/5/2018 10:14:26	11.0	8.54	92.7	7.78	45417	29.30
CLDS Reference	B	15	12/5/2018 10:14:54	10.9	8.65	93.9	7.78	45870	29.62
CLDS Reference	C	15	12/5/2018 10:15:23	11.4	8.70	95.8	7.80	46596	30.16
CLDS Reference	D	15	12/5/2018 10:15:50	11.4	8.18	90.0	7.77	46351	29.99
CLDS Reference	E	15	12/5/2018 10:16:12	11.5	8.52	94.2	7.78	46651	30.21
Composite 2	A	15	12/5/2018 10:16:34	11.4	8.16	89.6	7.79	46396	30.02
Composite 2	B	15	12/5/2018 10:17:02	11.1	6.87	74.6	7.72	45127	29.10

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	C	15	12/5/2018 10:17:30	11.5	8.55	94.4	7.78	46663	30.21
Composite 2	D	15	12/5/2018 10:17:58	11.4	8.52	93.8	7.78	46680	30.22
Composite 2	E	15	12/5/2018 10:18:23	11.2	8.21	90.1	7.77	46608	30.16
Composite 3	A	15	12/5/2018 10:18:47	11.1	8.41	91.9	7.76	46331	29.96
Composite 3	B	15	12/5/2018 10:19:11	11.1	8.50	92.6	7.77	45612	29.44
Composite 3	C	15	12/5/2018 10:19:35	11.2	7.96	87.3	7.74	46490	30.08
Composite 3	D	15	12/5/2018 10:19:58	11.0	8.65	94.1	7.76	45624	29.45
Composite 3	E	15	12/5/2018 10:20:32	11.1	8.44	92.0	7.76	46023	29.74
Composite 4	A	15	12/5/2018 10:20:56	11.0	8.15	88.4	7.74	45293	29.21
Composite 4	B	15	12/5/2018 10:21:20	11.1	8.42	91.9	7.75	46029	29.74
Composite 4	C	15	12/5/2018 10:21:41	11.1	8.47	92.1	7.76	45596	29.43
Composite 4	D	15	12/5/2018 10:22:03	11.3	8.44	92.4	7.75	45987	29.72
Composite 4	E	15	12/5/2018 10:22:19	11.3	8.50	93.2	7.76	46496	30.08
Composite 5	A	15	12/5/2018 10:22:46	11.1	8.56	93.1	7.78	45327	29.24
Composite 5	B	15	12/5/2018 10:23:10	11.1	8.08	88.1	7.76	45939	29.67
Composite 5	C	15	12/5/2018 10:23:35	11.0	8.17	88.9	7.79	45813	29.58
Composite 5	D	15	12/5/2018 10:23:59	11.1	8.45	92.0	7.80	45898	29.65
Composite 5	E	15	12/5/2018 10:24:24	11.2	7.61	83.1	7.77	46060	29.77
Composite 6	A	15	12/5/2018 10:24:55	10.9	9.05	98.0	7.79	45691	29.49
Composite 6	B	15	12/5/2018 10:25:11	11.0	9.07	98.7	7.80	45939	29.67
Composite 6	C	15	12/5/2018 10:25:33	11.1	8.57	93.5	7.77	46316	29.94
Composite 6	D	15	12/5/2018 10:25:56	11.4	8.40	92.2	7.78	46194	29.87
Composite 6	E	15	12/5/2018 10:26:18	11.3	8.44	92.5	7.78	45998	29.73
Laboratory Control	A	16	12/6/2018 10:12:59	11.1	8.20	90.3	7.75	47618	30.88
Laboratory Control	B	16	12/6/2018 10:13:28	11.2	8.86	97.6	7.78	47199	30.59
Laboratory Control	C	16	12/6/2018 10:13:58	11.1	8.87	97.7	7.79	47657	30.91
Laboratory Control	D	16	12/6/2018 10:14:24	11.1	8.88	97.5	7.80	47126	30.53
Laboratory Control	E	16	12/6/2018 10:15:03	11.1	8.91	98.1	7.82	47554	30.84
CLDS Reference	A	16	12/6/2018 10:15:26	11.0	8.77	96.1	7.80	47090	30.50
CLDS Reference	B	16	12/6/2018 10:15:50	10.8	8.70	95.0	7.78	47167	30.54
CLDS Reference	C	16	12/6/2018 10:16:28	11.3	8.75	96.7	7.80	47495	30.81
CLDS Reference	D	16	12/6/2018 10:16:54	11.4	8.29	91.9	7.78	47426	30.76
CLDS Reference	E	16	12/6/2018 10:17:19	11.5	8.54	94.8	7.80	47439	30.77
Composite 2	A	16	12/6/2018 10:17:39	11.4	8.19	90.6	7.80	47496	30.81
Composite 2	B	16	12/6/2018 10:18:55	11.7	7.96	88.6	7.81	47285	30.67
Composite 2	C	16	12/6/2018 10:19:19	11.4	8.61	95.4	7.82	47523	30.83
Composite 2	D	16	12/6/2018 10:19:46	11.1	8.55	94.1	7.80	47679	30.92
Composite 2	E	16	12/6/2018 10:20:12	11.0	8.15	89.4	7.78	47677	30.92
Composite 3	A	16	12/6/2018 10:20:35	11.0	8.52	93.6	7.77	47470	30.77
Composite 3	B	16	12/6/2018 10:20:59	11.0	8.54	93.6	7.78	47083	30.49
Composite 3	C	16	12/6/2018 10:21:30	11.1	7.93	87.3	7.76	47506	30.80
Composite 3	D	16	12/6/2018 10:21:49	10.9	8.72	95.4	7.77	46968	30.41
Composite 3	E	16	12/6/2018 10:22:13	11.0	8.51	93.3	7.77	47272	30.63
Composite 4	A	16	12/6/2018 10:22:37	10.9	8.03	87.5	7.74	46456	30.04
Composite 4	B	16	12/6/2018 10:23:02	11.1	8.50	93.3	7.75	47287	30.64

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	C	16	12/6/2018 10:23:28	11.0	8.53	93.4	7.76	46932	30.38
Composite 4	D	16	12/6/2018 10:23:47	11.2	8.43	92.8	7.75	47319	30.67
Composite 4	E	16	12/6/2018 10:24:06	11.2	8.58	94.6	7.77	47623	30.89
Composite 5	A	16	12/6/2018 10:24:33	11.0	8.84	96.6	7.79	46611	30.15
Composite 5	B	16	12/6/2018 10:24:56	11.0	7.94	87.0	7.77	47228	30.59
Composite 5	C	16	12/6/2018 10:25:19	10.9	8.41	91.9	7.80	47056	30.47
Composite 5	D	16	12/6/2018 10:25:36	10.9	8.50	93.0	7.80	47109	30.50
Composite 5	E	16	12/6/2018 10:25:56	11.0	8.21	90.1	7.79	47324	30.67
Composite 6	A	16	12/6/2018 10:26:50	10.8	9.10	99.2	7.79	46982	30.41
Composite 6	B	16	12/6/2018 10:27:13	10.9	9.05	98.9	7.79	47269	30.62
Composite 6	C	16	12/6/2018 10:27:31	11.0	8.56	94.0	7.76	47500	30.79
Composite 6	D	16	12/6/2018 10:27:53	11.3	8.32	91.8	7.77	47349	30.70
Composite 6	E	16	12/6/2018 10:28:17	11.2	8.04	88.6	7.78	47293	30.65
Laboratory Control	A	17	12/7/2018 10:06:26	11.6	8.90	97.3	7.79	44634	28.77
Laboratory Control	B	17	12/7/2018 10:06:48	11.6	9.25	101.2	7.80	44621	28.76
Laboratory Control	C	17	12/7/2018 10:07:05	11.6	9.21	100.9	7.80	44615	28.76
Laboratory Control	D	17	12/7/2018 10:07:27	11.7	9.29	101.7	7.81	44538	28.70
Laboratory Control	E	17	12/7/2018 10:07:48	11.6	9.30	101.6	7.82	44584	28.73
CLDS Reference	A	17	12/7/2018 10:08:04	11.0	9.19	99.5	7.80	45271	29.19
CLDS Reference	B	17	12/7/2018 10:08:23	11.3	9.06	98.4	7.81	44720	28.81
CLDS Reference	C	17	12/7/2018 10:08:44	11.7	9.21	100.9	7.82	44500	28.67
CLDS Reference	D	17	12/7/2018 10:09:00	11.7	9.15	100.3	7.82	44504	28.68
CLDS Reference	E	17	12/7/2018 10:09:16	11.6	9.03	98.8	7.81	44613	28.75
Composite 2	A	17	12/7/2018 10:09:34	11.6	8.98	98.3	7.83	44559	28.72
Composite 2	B	17	12/7/2018 10:09:48	11.6	8.79	96.2	7.82	44579	28.73
Composite 2	C	17	12/7/2018 10:10:06	11.6	9.05	99.1	7.83	44536	28.70
Composite 2	D	17	12/7/2018 10:10:30	11.4	8.97	97.8	7.82	44727	28.83
Composite 2	E	17	12/7/2018 10:10:50	11.6	8.88	97.1	7.82	44581	28.73
Composite 3	A	17	12/7/2018 10:11:11	11.7	8.95	98.0	7.82	44516	28.69
Composite 3	B	17	12/7/2018 10:11:24	11.7	8.98	98.5	7.82	44492	28.67
Composite 3	C	17	12/7/2018 10:11:48	11.4	7.76	84.5	7.80	44859	28.92
Composite 3	D	17	12/7/2018 10:12:08	11.6	8.98	98.2	7.82	44518	28.69
Composite 3	E	17	12/7/2018 10:12:29	11.5	8.89	97.1	7.82	44646	28.77
Composite 4	A	17	12/7/2018 10:12:44	11.7	8.94	98.0	7.83	44519	28.69
Composite 4	B	17	12/7/2018 10:12:55	11.5	8.96	97.9	7.82	44709	28.82
Composite 4	C	17	12/7/2018 10:13:14	11.6	8.94	97.7	7.82	44592	28.74
Composite 4	D	17	12/7/2018 10:13:32	11.7	8.96	98.1	7.82	44542	28.70
Composite 4	E	17	12/7/2018 10:13:48	11.6	9.11	99.8	7.83	44531	28.69
Composite 5	A	17	12/7/2018 10:14:12	11.7	9.03	98.9	7.84	44514	28.68
Composite 5	B	17	12/7/2018 10:14:30	11.7	8.75	95.9	7.83	44500	28.68
Composite 5	C	17	12/7/2018 10:14:42	11.7	8.83	96.9	7.84	44535	28.70
Composite 5	D	17	12/7/2018 10:14:55	11.8	8.93	98.0	7.85	44479	28.66
Composite 5	E	17	12/7/2018 10:15:17	11.6	8.82	96.4	7.84	44596	28.74
Composite 6	A	17	12/7/2018 10:15:41	11.2	9.38	101.8	7.85	44975	28.99
Composite 6	B	17	12/7/2018 10:16:00	11.5	9.35	102.1	7.85	44597	28.74

STUDY: 31250
CLIENT: AECOM
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ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	C	17	12/7/2018 10:16:16	11.4	8.92	97.4	7.82	44985	29.01
Composite 6	D	17	12/7/2018 10:16:32	11.8	8.92	97.9	7.83	44523	28.69
Composite 6	E	17	12/7/2018 10:16:59	11.6	9.04	98.9	7.84	44569	28.72
Laboratory Control	A	18	12/8/2018 10:04:37	11.7	8.92	96.7	7.82	44123	28.40
Laboratory Control	B	18	12/8/2018 10:05:05	11.7	9.22	100.0	7.83	44113	28.40
Laboratory Control	C	18	12/8/2018 10:05:32	11.7	8.99	97.6	7.83	44081	28.38
Laboratory Control	D	18	12/8/2018 10:05:50	11.8	9.24	100.4	7.84	44043	28.35
Laboratory Control	E	18	12/8/2018 10:06:11	11.7	9.33	101.3	7.85	44044	28.35
CLDS Reference	A	18	12/8/2018 10:06:25	11.5	9.04	97.7	7.84	44222	28.47
CLDS Reference	B	18	12/8/2018 10:06:42	11.5	9.14	98.8	7.84	44117	28.39
CLDS Reference	C	18	12/8/2018 10:07:07	11.9	9.23	100.4	7.84	44028	28.35
CLDS Reference	D	18	12/8/2018 10:07:29	11.9	9.11	99.1	7.84	44025	28.34
CLDS Reference	E	18	12/8/2018 10:07:39	11.8	9.12	99.0	7.84	44069	28.37
Composite 2	A	18	12/8/2018 10:07:52	11.8	9.04	98.2	7.85	44052	28.36
Composite 2	B	18	12/8/2018 10:08:11	11.7	8.70	94.3	7.84	44079	28.38
Composite 2	C	18	12/8/2018 10:08:54	11.8	8.80	95.6	7.85	44050	28.36
Composite 2	D	18	12/8/2018 10:09:19	11.6	8.86	95.9	7.84	44182	28.44
Composite 2	E	18	12/8/2018 10:09:43	11.7	8.97	97.3	7.85	44064	28.37
Composite 3	A	18	12/8/2018 10:09:58	11.8	8.94	97.2	7.84	44039	28.35
Composite 3	B	18	12/8/2018 10:10:14	11.9	8.95	97.3	7.84	44026	28.34
Composite 3	C	18	12/8/2018 10:10:36	11.6	8.11	87.8	7.82	44206	28.46
Composite 3	D	18	12/8/2018 10:10:56	11.8	9.04	98.2	7.84	44036	28.35
Composite 3	E	18	12/8/2018 10:11:25	11.7	8.91	96.5	7.84	44109	28.39
Composite 4	A	18	12/8/2018 10:11:45	11.8	8.94	97.2	7.84	44035	28.35
Composite 4	B	18	12/8/2018 10:12:04	11.7	8.95	97.1	7.83	44111	28.40
Composite 4	C	18	12/8/2018 10:12:19	11.7	8.97	97.4	7.84	44068	28.37
Composite 4	D	18	12/8/2018 10:12:40	11.8	8.94	97.1	7.83	44056	28.36
Composite 4	E	18	12/8/2018 10:12:59	11.8	9.14	99.3	7.84	44039	28.35
Composite 5	A	18	12/8/2018 10:13:20	11.8	9.09	98.8	7.85	44028	28.34
Composite 5	B	18	12/8/2018 10:13:44	11.8	8.67	94.2	7.85	44032	28.35
Composite 5	C	18	12/8/2018 10:14:05	11.8	8.84	96.0	7.86	44068	28.37
Composite 5	D	18	12/8/2018 10:14:25	11.9	9.06	98.6	7.86	44021	28.34
Composite 5	E	18	12/8/2018 10:14:45	11.7	8.71	94.5	7.85	44085	28.38
Composite 6	A	18	12/8/2018 10:15:08	11.3	9.35	100.7	7.85	44418	28.60
Composite 6	B	18	12/8/2018 10:15:22	11.5	9.30	100.5	7.85	44107	28.39
Composite 6	C	18	12/8/2018 10:15:43	11.5	8.73	94.4	7.82	44424	28.61
Composite 6	D	18	12/8/2018 10:16:04	11.9	8.97	97.6	7.84	44028	28.35
Composite 6	E	18	12/8/2018 10:16:22	11.7	8.98	97.4	7.84	44071	28.37
Laboratory Control	A	19	12/9/2018 12:51:47	11.7	9.00	98.0	7.79	43608	28.04
Laboratory Control	B	19	12/9/2018 12:52:11	11.8	9.27	100.9	7.80	43449	27.93
Laboratory Control	C	19	12/9/2018 12:52:23	11.8	9.34	101.7	7.81	43547	28.00
Laboratory Control	D	19	12/9/2018 12:52:43	11.8	9.44	103.0	7.82	43632	28.06
Laboratory Control	E	19	12/9/2018 12:53:04	11.8	9.46	103.1	7.83	43626	28.06
CLDS Reference	A	19	12/9/2018 12:53:24	11.5	9.21	99.7	7.82	43502	27.96

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
CLDS Reference	B	19	12/9/2018 12:53:43	11.5	9.22	99.9	7.82	43606	28.03
CLDS Reference	C	19	12/9/2018 12:54:05	11.9	9.41	102.7	7.83	43680	28.10
CLDS Reference	D	19	12/9/2018 12:54:24	11.9	9.33	101.9	7.83	43670	28.09
CLDS Reference	E	19	12/9/2018 12:54:43	11.8	9.21	100.3	7.82	43619	28.05
Composite 2	A	19	12/9/2018 12:55:03	11.8	9.12	99.5	7.84	43653	28.08
Composite 2	B	19	12/9/2018 12:55:23	11.6	8.68	94.2	7.83	43543	27.99
Composite 2	C	19	12/9/2018 12:55:42	11.8	9.15	99.8	7.84	43680	28.09
Composite 2	D	19	12/9/2018 12:56:04	11.7	8.96	97.4	7.82	43529	27.98
Composite 2	E	19	12/9/2018 12:56:24	11.8	9.10	99.3	7.83	43741	28.14
Composite 3	A	19	12/9/2018 12:56:46	11.8	9.05	98.7	7.83	43625	28.06
Composite 3	B	19	12/9/2018 12:57:06	11.9	9.15	100.0	7.84	43672	28.09
Composite 3	C	19	12/9/2018 12:57:27	11.7	8.61	93.5	7.80	43568	28.01
Composite 3	D	19	12/9/2018 12:57:48	11.8	9.17	99.9	7.83	43656	28.08
Composite 3	E	19	12/9/2018 12:58:10	11.7	9.04	98.2	7.83	43568	28.01
Composite 4	A	19	12/9/2018 12:58:31	11.9	9.17	100.1	7.83	43656	28.08
Composite 4	B	19	12/9/2018 12:58:45	11.7	9.12	99.2	7.82	43566	28.01
Composite 4	C	19	12/9/2018 12:59:07	11.8	8.98	97.8	7.83	43623	28.05
Composite 4	D	19	12/9/2018 12:59:27	11.7	9.08	98.8	7.82	43598	28.03
Composite 4	E	19	12/9/2018 12:59:41	11.8	9.25	101.0	7.83	43704	28.11
Composite 5	A	19	12/9/2018 13:00:03	11.9	9.12	99.6	7.84	43661	28.08
Composite 5	B	19	12/9/2018 13:00:24	11.9	8.96	97.9	7.84	43639	28.07
Composite 5	C	19	12/9/2018 13:00:45	11.8	8.96	97.5	7.86	43539	27.99
Composite 5	D	19	12/9/2018 13:01:09	11.9	9.12	99.7	7.85	43668	28.09
Composite 5	E	19	12/9/2018 13:01:32	11.7	8.78	95.4	7.84	43536	27.99
Composite 6	A	19	12/9/2018 13:01:58	11.3	9.45	102.0	7.85	43599	28.02
Composite 6	B	19	12/9/2018 13:02:20	11.6	9.37	101.7	7.85	43640	28.06
Composite 6	C	19	12/9/2018 13:02:42	11.5	8.74	94.7	7.80	43542	27.99
Composite 6	D	19	12/9/2018 13:03:06	11.9	9.07	99.1	7.82	43640	28.07
Composite 6	E	19	12/9/2018 13:03:28	11.7	9.09	99.0	7.82	43589	28.03
Laboratory Control	A	20	12/10/2018 11:17:27	11.4	8.78	95.1	7.78	42924	27.54
Laboratory Control	B	20	12/10/2018 11:17:49	11.5	9.31	101.1	7.81	42803	27.46
Laboratory Control	C	20	12/10/2018 11:18:09	11.5	9.36	101.8	7.82	42932	27.55
Laboratory Control	D	20	12/10/2018 11:18:30	11.7	9.38	102.4	7.83	42974	27.59
Laboratory Control	E	20	12/10/2018 11:18:44	11.6	9.46	103.1	7.84	42958	27.58
CLDS Reference	A	20	12/10/2018 11:18:57	11.2	9.39	101.3	7.83	42806	27.45
CLDS Reference	B	20	12/10/2018 11:19:14	11.3	9.25	100.1	7.83	42963	27.56
CLDS Reference	C	20	12/10/2018 11:19:38	11.8	9.39	102.7	7.83	42977	27.60
CLDS Reference	D	20	12/10/2018 11:19:58	11.9	9.26	101.3	7.83	42949	27.58
CLDS Reference	E	20	12/10/2018 11:20:19	11.6	9.19	100.1	7.83	42949	27.57
Composite 2	A	20	12/10/2018 11:20:44	11.7	9.07	99.0	7.84	42970	27.59
Composite 2	B	20	12/10/2018 11:21:06	11.4	8.54	92.5	7.83	42875	27.51
Composite 2	C	20	12/10/2018 11:21:26	11.7	9.15	99.9	7.84	42967	27.59
Composite 2	D	20	12/10/2018 11:21:49	11.4	9.00	97.6	7.83	42869	27.50
Composite 2	E	20	12/10/2018 11:22:10	11.7	9.07	98.9	7.84	42959	27.58
Composite 3	A	20	12/10/2018 11:22:29	11.7	9.03	98.6	7.83	42942	27.57

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 3	B	20	12/10/2018 11:22:52	11.8	9.09	99.3	7.84	42957	27.58
Composite 3	C	20	12/10/2018 11:23:09	11.4	8.75	94.9	7.82	42900	27.53
Composite 3	D	20	12/10/2018 11:23:29	11.6	9.17	100.0	7.84	42962	27.58
Composite 3	E	20	12/10/2018 11:23:52	11.4	9.06	98.3	7.84	42907	27.53
Composite 4	A	20	12/10/2018 11:24:12	11.8	9.07	99.2	7.84	42961	27.58
Composite 4	B	20	12/10/2018 11:24:33	11.6	9.04	98.3	7.83	42908	27.54
Composite 4	C	20	12/10/2018 11:24:55	11.6	9.01	98.2	7.83	42954	27.57
Composite 4	D	20	12/10/2018 11:25:17	11.5	9.01	98.0	7.83	42930	27.55
Composite 4	E	20	12/10/2018 11:25:31	11.8	9.15	100.0	7.84	42976	27.59
Composite 5	A	20	12/10/2018 11:26:03	11.7	9.17	100.1	7.85	42955	27.58
Composite 5	B	20	12/10/2018 11:26:18	11.8	8.94	97.7	7.84	42949	27.57
Composite 5	C	20	12/10/2018 11:26:33	11.5	9.00	97.8	7.86	42882	27.52
Composite 5	D	20	12/10/2018 11:26:54	11.8	9.15	100.0	7.86	42955	27.58
Composite 5	E	20	12/10/2018 11:27:12	11.5	8.87	96.3	7.86	42893	27.52
Composite 6	A	20	12/10/2018 11:27:43	11.1	9.47	102.0	7.85	42870	27.49
Composite 6	B	20	12/10/2018 11:28:01	11.4	9.40	102.0	7.84	42928	27.55
Composite 6	C	20	12/10/2018 11:28:23	11.3	8.84	95.4	7.81	42681	27.36
Composite 6	D	20	12/10/2018 11:28:43	11.7	9.03	98.5	7.82	42933	27.56
Composite 6	E	20	12/10/2018 11:29:07	11.6	9.09	99.0	7.83	42937	27.56
Laboratory Control	A	21	12/11/2018 09:31:23	11.3	8.62	94.5	7.77	46609	30.17
Laboratory Control	B	21	12/11/2018 09:31:50	11.5	9.28	102.1	7.81	46421	30.04
Laboratory Control	C	21	12/11/2018 09:32:12	11.6	9.31	102.7	7.82	46234	29.91
Laboratory Control	D	21	12/11/2018 09:32:33	11.6	9.33	102.9	7.83	46238	29.92
Laboratory Control	E	21	12/11/2018 09:32:52	11.7	9.35	103.2	7.84	46159	29.86
CLDS Reference	A	21	12/11/2018 09:33:14	11.2	9.23	100.9	7.83	46409	30.02
CLDS Reference	B	21	12/11/2018 09:33:40	11.4	9.18	100.7	7.83	46292	29.94
CLDS Reference	C	21	12/11/2018 09:34:02	11.9	9.26	102.6	7.84	46052	29.79
CLDS Reference	D	21	12/11/2018 09:34:16	11.9	9.24	102.4	7.84	46065	29.80
CLDS Reference	E	21	12/11/2018 09:34:32	11.7	9.13	100.8	7.83	46193	29.89
Composite 2	A	21	12/11/2018 09:34:44	11.8	9.02	99.7	7.84	46118	29.84
Composite 2	B	21	12/11/2018 09:34:56	11.4	8.82	96.8	7.83	46418	30.03
Composite 2	C	21	12/11/2018 09:35:11	11.8	9.09	100.5	7.84	46112	29.83
Composite 2	D	21	12/11/2018 09:35:34	11.5	8.98	98.8	7.84	46323	29.97
Composite 2	E	21	12/11/2018 09:35:54	11.8	9.14	101.1	7.85	46093	29.82
Composite 3	A	21	12/11/2018 09:36:16	11.8	8.92	98.7	7.84	46151	29.86
Composite 3	B	21	12/11/2018 09:36:33	11.9	9.02	99.9	7.84	46079	29.81
Composite 3	C	21	12/11/2018 09:36:49	11.5	8.92	98.2	7.84	46306	29.96
Composite 3	D	21	12/11/2018 09:37:13	11.6	9.11	100.5	7.84	46182	29.88
Composite 3	E	21	12/11/2018 09:37:33	11.4	8.99	98.6	7.84	46415	30.03
Composite 4	A	21	12/11/2018 09:37:55	11.8	9.06	100.2	7.84	46098	29.82
Composite 4	B	21	12/11/2018 09:38:10	11.6	9.03	99.4	7.84	46304	29.96
Composite 4	C	21	12/11/2018 09:38:32	11.7	8.98	99.1	7.84	46190	29.88
Composite 4	D	21	12/11/2018 09:38:48	11.5	8.99	99.0	7.83	46320	29.97
Composite 4	E	21	12/11/2018 09:39:08	11.8	9.13	101.0	7.84	46062	29.80
Composite 5	A	21	12/11/2018 09:39:35	11.8	9.03	99.9	7.84	46125	29.84

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 5	B	21	12/11/2018 09:39:56	11.8	9.00	99.6	7.85	46114	29.84
Composite 5	C	21	12/11/2018 09:40:23	11.6	8.92	98.3	7.87	46333	29.98
Composite 5	D	21	12/11/2018 09:40:46	11.8	9.01	99.8	7.86	46092	29.82
Composite 5	E	21	12/11/2018 09:41:08	11.5	8.83	97.2	7.86	46301	29.96
Composite 6	A	21	12/11/2018 09:41:29	11.1	9.38	102.4	7.83	46523	30.09
Composite 6	B	21	12/11/2018 09:41:51	11.5	9.30	102.2	7.82	46236	29.91
Composite 6	C	21	12/11/2018 09:42:12	11.2	8.83	96.7	7.80	46312	29.95
Composite 6	D	21	12/11/2018 09:42:28	11.7	8.97	99.2	7.82	46169	29.87
Composite 6	E	21	12/11/2018 09:42:48	11.7	9.04	99.8	7.83	46221	29.91
Laboratory Control	A	22	12/12/2018 10:22:14	11.2	8.61	94.9	7.75	46922	30.39
Laboratory Control	B	22	12/12/2018 10:22:37	11.4	9.33	103.2	7.80	46782	30.30
Laboratory Control	C	22	12/12/2018 10:22:56	11.4	9.38	103.5	7.82	46276	29.93
Laboratory Control	D	22	12/12/2018 10:23:17	11.5	9.42	104.1	7.83	46166	29.86
Laboratory Control	E	22	12/12/2018 10:23:38	11.6	9.47	104.8	7.84	46055	29.78
CLDS Reference	A	22	12/12/2018 10:23:56	11.1	9.29	102.0	7.82	46724	30.24
CLDS Reference	B	22	12/12/2018 10:24:17	11.3	9.21	101.3	7.82	46227	29.89
CLDS Reference	C	22	12/12/2018 10:24:39	11.8	9.32	103.5	7.83	46001	29.75
CLDS Reference	D	22	12/12/2018 10:25:00	11.8	9.23	102.6	7.83	46000	29.75
CLDS Reference	E	22	12/12/2018 10:25:15	11.6	9.20	101.9	7.83	46112	29.83
Composite 2	A	22	12/12/2018 10:25:28	11.7	9.09	100.9	7.84	46048	29.78
Composite 2	B	22	12/12/2018 10:25:46	11.3	8.74	96.4	7.83	46489	30.08
Composite 2	C	22	12/12/2018 10:26:05	11.7	9.22	102.4	7.84	46033	29.77
Composite 2	D	22	12/12/2018 10:26:29	11.3	9.03	99.5	7.83	46560	30.13
Composite 2	E	22	12/12/2018 10:26:50	11.7	9.18	101.8	7.85	46031	29.77
Composite 3	A	22	12/12/2018 10:27:09	11.7	9.03	100.1	7.84	46078	29.80
Composite 3	B	22	12/12/2018 10:27:23	11.8	9.10	101.1	7.84	46004	29.75
Composite 3	C	22	12/12/2018 10:27:48	11.4	8.90	98.2	7.82	46308	29.96
Composite 3	D	22	12/12/2018 10:28:09	11.5	9.21	101.7	7.84	46117	29.82
Composite 3	E	22	12/12/2018 10:28:30	11.3	9.02	99.4	7.84	46512	30.10
Composite 4	A	22	12/12/2018 10:28:46	11.8	9.14	101.5	7.84	46013	29.76
Composite 4	B	22	12/12/2018 10:29:12	11.5	9.01	99.6	7.83	46287	29.94
Composite 4	C	22	12/12/2018 10:29:35	11.6	9.10	100.8	7.84	46113	29.82
Composite 4	D	22	12/12/2018 10:29:52	11.5	8.98	99.3	7.83	46293	29.95
Composite 4	E	22	12/12/2018 10:30:12	11.7	9.17	101.7	7.84	46038	29.78
Composite 5	A	22	12/12/2018 10:30:39	11.7	9.12	101.2	7.85	46056	29.79
Composite 5	B	22	12/12/2018 10:31:02	11.7	9.00	99.9	7.84	46037	29.78
Composite 5	C	22	12/12/2018 10:31:23	11.5	8.98	99.3	7.86	46370	30.00
Composite 5	D	22	12/12/2018 10:31:44	11.8	9.10	101.1	7.86	46035	29.78
Composite 5	E	22	12/12/2018 10:32:06	11.5	8.87	98.1	7.86	46266	29.93
Composite 6	A	22	12/12/2018 10:32:29	11.0	9.50	104.3	7.85	46914	30.37
Composite 6	B	22	12/12/2018 10:32:51	11.4	9.44	104.1	7.85	46147	29.84
Composite 6	C	22	12/12/2018 10:33:12	11.2	8.79	96.9	7.80	46912	30.38
Composite 6	D	22	12/12/2018 10:33:33	11.7	8.92	98.8	7.83	46098	29.82
Composite 6	E	22	12/12/2018 10:33:55	11.6	9.09	100.6	7.83	46165	29.86

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	A	23	12/13/2018 08:58:12	11.5	8.51	92.6	7.67	46860	30.35
Laboratory Control	B	23	12/13/2018 08:58:35	11.7	9.23	100.8	7.73	46573	30.16
Laboratory Control	C	23	12/13/2018 08:58:57	11.7	9.31	101.5	7.75	45890	29.67
Laboratory Control	D	23	12/13/2018 08:59:19	11.8	9.34	101.9	7.76	45731	29.56
Laboratory Control	E	23	12/13/2018 08:59:40	11.9	9.38	102.5	7.76	45612	29.48
CLDS Reference	A	23	12/13/2018 09:00:01	11.5	9.12	99.1	7.75	46600	30.17
CLDS Reference	B	23	12/13/2018 09:00:21	11.7	9.11	99.2	7.75	45792	29.60
CLDS Reference	C	23	12/13/2018 09:00:43	12.1	9.32	102.2	7.76	45546	29.44
CLDS Reference	D	23	12/13/2018 09:01:04	12.1	9.21	101.1	7.76	45552	29.45
CLDS Reference	E	23	12/13/2018 09:01:27	11.9	9.16	100.2	7.76	45661	29.52
Composite 2	A	23	12/13/2018 09:01:49	12.0	9.07	99.3	7.77	45611	29.48
Composite 2	B	23	12/13/2018 09:02:10	11.6	8.44	91.9	7.75	46379	30.01
Composite 2	C	23	12/13/2018 09:02:30	12.1	9.16	100.6	7.77	45571	29.46
Composite 2	D	23	12/13/2018 09:02:55	11.7	8.94	97.5	7.77	46100	29.82
Composite 2	E	23	12/13/2018 09:04:01	11.9	9.03	98.7	7.78	45608	29.48
Composite 3	A	23	12/13/2018 09:04:22	11.9	8.96	97.9	7.78	45661	29.51
Composite 3	B	23	12/13/2018 09:04:44	12.0	9.07	99.3	7.78	45574	29.45
Composite 3	C	23	12/13/2018 09:05:00	11.7	9.22	100.5	7.78	45830	29.63
Composite 3	D	23	12/13/2018 09:05:21	11.8	9.18	100.2	7.78	45688	29.53
Composite 3	E	23	12/13/2018 09:05:43	11.6	8.94	97.2	7.78	46169	29.86
Composite 4	A	23	12/13/2018 09:05:59	12.0	9.12	100.0	7.78	45562	29.45
Composite 4	B	23	12/13/2018 09:06:20	11.8	8.93	97.4	7.77	45848	29.64
Composite 4	C	23	12/13/2018 09:06:41	11.9	8.95	97.8	7.78	45666	29.52
Composite 4	D	23	12/13/2018 09:06:55	11.8	8.90	97.1	7.77	45871	29.66
Composite 4	E	23	12/13/2018 09:07:17	12.1	9.12	100.0	7.78	45589	29.47
Composite 5	A	23	12/13/2018 09:07:49	11.8	9.10	99.2	7.79	45744	29.57
Composite 5	B	23	12/13/2018 09:08:04	12.0	9.00	98.4	7.78	45584	29.46
Composite 5	C	23	12/13/2018 09:08:26	11.7	8.83	96.2	7.80	46009	29.75
Composite 5	D	23	12/13/2018 09:08:45	11.9	9.03	98.7	7.80	45616	29.48
Composite 5	E	23	12/13/2018 09:09:08	11.8	8.75	95.6	7.79	45741	29.57
Composite 6	A	23	12/13/2018 09:09:34	11.3	9.34	101.2	7.77	46758	30.27
Composite 6	B	23	12/13/2018 09:09:56	11.5	9.37	101.7	7.77	45788	29.59
Composite 6	C	23	12/13/2018 09:10:19	11.4	8.65	94.2	7.73	47011	30.46
Composite 6	D	23	12/13/2018 09:10:42	11.9	9.01	98.6	7.76	45657	29.51
Composite 6	E	23	12/13/2018 09:11:07	11.9	8.97	98.0	7.77	45780	29.60
Laboratory Control	A	24	12/14/2018 11:58:50	11.3	8.49	92.5	7.67	47585	30.87
Laboratory Control	B	24	12/14/2018 11:59:14	11.4	9.30	101.4	7.72	47041	30.48
Laboratory Control	C	24	12/14/2018 11:59:33	11.4	9.38	102.0	7.74	46353	29.99
Laboratory Control	D	24	12/14/2018 11:59:48	11.4	9.32	101.3	7.74	46115	29.82
Laboratory Control	E	24	12/14/2018 12:00:08	11.5	9.43	102.7	7.75	46020	29.75
CLDS Reference	A	24	12/14/2018 12:00:34	11.1	9.29	100.7	7.75	46889	30.36
CLDS Reference	B	24	12/14/2018 12:00:54	11.2	9.30	100.6	7.75	46166	29.84
CLDS Reference	C	24	12/14/2018 12:01:16	11.6	9.30	101.5	7.76	45980	29.73
CLDS Reference	D	24	12/14/2018 12:01:28	11.7	9.25	101.1	7.76	45984	29.74
CLDS Reference	E	24	12/14/2018 12:01:49	11.6	9.20	100.4	7.76	46053	29.78

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 2	A	24	12/14/2018 12:02:06	11.6	9.04	98.6	7.76	45922	29.69
Composite 2	B	24	12/14/2018 12:02:30	11.3	8.74	95.1	7.74	46684	30.22
Composite 2	C	24	12/14/2018 12:02:50	11.6	9.11	99.4	7.77	46007	29.75
Composite 2	D	24	12/14/2018 12:03:13	11.4	9.01	98.0	7.76	46356	29.99
Composite 2	E	24	12/14/2018 12:03:30	11.5	9.13	99.4	7.77	46077	29.80
Composite 3	A	24	12/14/2018 12:03:51	11.5	9.10	99.1	7.77	46063	29.79
Composite 3	B	24	12/14/2018 12:04:15	11.6	9.08	99.0	7.77	46013	29.75
Composite 3	C	24	12/14/2018 12:04:35	11.3	8.34	90.7	7.75	46376	30.00
Composite 3	D	24	12/14/2018 12:04:56	11.4	9.10	98.8	7.77	46117	29.82
Composite 3	E	24	12/14/2018 12:05:20	11.3	9.03	98.1	7.78	46565	30.13
Composite 4	A	24	12/14/2018 12:05:41	11.7	9.06	98.9	7.78	45986	29.74
Composite 4	B	24	12/14/2018 12:06:02	11.4	8.95	97.3	7.76	46237	29.91
Composite 4	C	24	12/14/2018 12:06:22	11.5	9.12	99.4	7.77	46058	29.78
Composite 4	D	24	12/14/2018 12:06:40	11.5	9.03	98.3	7.76	46196	29.88
Composite 4	E	24	12/14/2018 12:06:55	11.6	9.16	100.0	7.77	46007	29.75
Composite 5	A	24	12/14/2018 12:07:19	11.5	9.17	99.9	7.79	46154	29.85
Composite 5	B	24	12/14/2018 12:07:42	11.6	8.96	97.9	7.77	45995	29.74
Composite 5	C	24	12/14/2018 12:07:56	11.4	9.04	98.5	7.78	46345	29.98
Composite 5	D	24	12/14/2018 12:08:15	11.6	9.11	99.4	7.78	46012	29.75
Composite 5	E	24	12/14/2018 12:08:40	11.6	8.98	97.9	7.78	46081	29.80
Composite 6	A	24	12/14/2018 12:09:06	11.0	9.34	101.2	7.78	47401	30.72
Composite 6	B	24	12/14/2018 12:09:25	11.3	9.35	101.5	7.79	46157	29.84
Composite 6	C	24	12/14/2018 12:09:38	11.2	8.89	96.9	7.75	47895	31.09
Composite 6	D	24	12/14/2018 12:09:55	11.6	9.04	98.7	7.77	46032	29.77
Composite 6	E	24	12/14/2018 12:10:09	11.5	9.15	99.7	7.77	46158	29.85
Laboratory Control	A	25	12/15/2018 11:54:38	11.5	9.11	99.7	7.77	44716	28.82
Laboratory Control	B	25	12/15/2018 11:55:03	11.5	9.37	102.6	7.79	44720	28.83
Laboratory Control	C	25	12/15/2018 11:55:18	11.6	9.36	102.4	7.80	44559	28.71
Laboratory Control	D	25	12/15/2018 11:55:34	11.4	9.34	102.0	7.79	44661	28.78
Laboratory Control	E	25	12/15/2018 11:55:55	11.4	9.33	101.7	7.80	44669	28.78
CLDS Reference	A	25	12/15/2018 11:56:17	11.4	9.35	102.0	7.80	44620	28.75
CLDS Reference	B	25	12/15/2018 11:56:36	11.1	9.27	100.5	7.80	44793	28.86
CLDS Reference	C	25	12/15/2018 11:57:01	11.4	9.30	101.5	7.80	44618	28.75
CLDS Reference	D	25	12/15/2018 11:57:22	11.5	9.24	100.9	7.80	44616	28.75
CLDS Reference	E	25	12/15/2018 11:57:55	11.5	8.89	97.2	7.80	44601	28.74
Composite 2	A	25	12/15/2018 11:58:10	11.4	9.07	99.0	7.80	44674	28.79
Composite 2	B	25	12/15/2018 11:58:34	11.5	9.06	99.0	7.80	44576	28.72
Composite 2	C	25	12/15/2018 11:59:02	11.4	9.18	100.3	7.81	44650	28.77
Composite 2	D	25	12/15/2018 11:59:25	11.5	9.16	100.2	7.81	44608	28.74
Composite 2	E	25	12/15/2018 11:59:45	11.6	9.20	100.8	7.81	44532	28.69
Composite 3	A	25	12/15/2018 12:00:00	11.5	9.09	99.3	7.81	44608	28.74
Composite 3	B	25	12/15/2018 12:00:19	11.4	9.07	98.9	7.81	44662	28.78
Composite 3	C	25	12/15/2018 12:00:37	11.3	8.79	95.7	7.79	44772	28.85
Composite 3	D	25	12/15/2018 12:00:56	11.3	9.16	99.7	7.81	44730	28.82
Composite 3	E	25	12/15/2018 12:01:21	11.5	9.16	100.1	7.81	44578	28.72

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 4	A	25	12/15/2018 12:01:47	11.5	9.06	99.0	7.81	44623	28.75
Composite 4	B	25	12/15/2018 12:02:07	11.4	9.05	98.8	7.80	44680	28.79
Composite 4	C	25	12/15/2018 12:02:28	11.5	9.11	99.6	7.81	44585	28.73
Composite 4	D	25	12/15/2018 12:02:41	11.5	9.09	99.4	7.81	44583	28.73
Composite 4	E	25	12/15/2018 12:03:01	11.5	9.16	100.0	7.81	44612	28.75
Composite 5	A	25	12/15/2018 12:03:31	11.6	9.15	100.1	7.82	44587	28.73
Composite 5	B	25	12/15/2018 12:03:48	11.6	9.03	98.9	7.81	44571	28.72
Composite 5	C	25	12/15/2018 12:04:06	11.5	9.12	99.7	7.82	44612	28.75
Composite 5	D	25	12/15/2018 12:04:27	11.5	9.11	99.6	7.82	44624	28.76
Composite 5	E	25	12/15/2018 12:04:43	11.6	9.08	99.5	7.82	44543	28.70
Composite 6	A	25	12/15/2018 12:05:10	11.1	9.34	101.8	7.82	46027	29.74
Composite 6	B	25	12/15/2018 12:05:30	11.3	9.34	101.7	7.83	44743	28.83
Composite 6	C	25	12/15/2018 12:05:49	11.2	8.93	97.7	7.79	46104	29.80
Composite 6	D	25	12/15/2018 12:06:13	11.7	9.15	100.3	7.80	44529	28.69
Composite 6	E	25	12/15/2018 12:06:34	11.5	9.16	100.1	7.81	44630	28.76
Laboratory Control	A	26	12/16/2018 12:30:28	11.4	8.63	94.3	7.72	44658	28.77
Laboratory Control	B	26	12/16/2018 12:31:02	11.6	9.39	102.9	7.78	44408	28.60
Laboratory Control	C	26	12/16/2018 12:31:24	11.5	9.40	103.0	7.79	44310	28.53
Laboratory Control	D	26	12/16/2018 12:31:51	11.5	9.29	101.5	7.80	44360	28.57
Laboratory Control	E	26	12/16/2018 12:32:16	11.4	9.40	102.6	7.80	44367	28.57
CLDS Reference	A	26	12/16/2018 12:32:38	11.4	9.29	101.4	7.80	44358	28.56
CLDS Reference	B	26	12/16/2018 12:32:59	11.1	9.27	100.7	7.80	44498	28.65
CLDS Reference	C	26	12/16/2018 12:33:24	11.4	9.32	101.8	7.81	44352	28.56
CLDS Reference	D	26	12/16/2018 12:33:47	11.5	9.25	101.2	7.81	44352	28.56
CLDS Reference	E	26	12/16/2018 12:34:09	11.5	9.23	100.9	7.81	44350	28.56
Composite 2	A	26	12/16/2018 12:34:27	11.4	9.01	98.4	7.80	44395	28.59
Composite 2	B	26	12/16/2018 12:34:42	11.5	8.97	98.0	7.80	44350	28.56
Composite 2	C	26	12/16/2018 12:35:07	11.4	9.18	100.3	7.82	44389	28.58
Composite 2	D	26	12/16/2018 12:35:45	11.5	9.13	99.9	7.82	44346	28.56
Composite 2	E	26	12/16/2018 12:36:07	11.5	9.24	101.2	7.82	44395	28.59
Composite 3	A	26	12/16/2018 12:36:30	11.5	9.06	99.2	7.81	44344	28.56
Composite 3	B	26	12/16/2018 12:36:52	11.4	9.03	98.6	7.81	44383	28.58
Composite 3	C	26	12/16/2018 12:37:09	11.3	8.95	97.7	7.80	44458	28.63
Composite 3	D	26	12/16/2018 12:37:26	11.3	9.13	99.5	7.81	44436	28.61
Composite 3	E	26	12/16/2018 12:37:51	11.5	9.05	99.0	7.82	44356	28.56
Composite 4	A	26	12/16/2018 12:38:15	11.5	9.12	99.7	7.82	44364	28.57
Composite 4	B	26	12/16/2018 12:38:39	11.4	8.90	97.2	7.80	44443	28.62
Composite 4	C	26	12/16/2018 12:39:05	11.5	9.07	99.2	7.81	44364	28.57
Composite 4	D	26	12/16/2018 12:39:27	11.5	9.15	100.1	7.81	44355	28.56
Composite 4	E	26	12/16/2018 12:39:49	11.4	9.16	100.1	7.82	44385	28.58
Composite 5	A	26	12/16/2018 12:40:30	11.5	9.18	100.5	7.83	44369	28.57
Composite 5	B	26	12/16/2018 12:40:52	11.5	8.85	97.0	7.81	44349	28.56
Composite 5	C	26	12/16/2018 12:42:41	11.5	9.00	98.6	7.83	44359	28.57
Composite 5	D	26	12/16/2018 12:43:01	11.5	9.06	99.2	7.83	44364	28.57
Composite 5	E	26	12/16/2018 12:43:24	11.5	8.94	97.9	7.83	44353	28.56

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Composite 6	A	26	12/16/2018 12:44:02	11.0	9.36	102.2	7.83	46183	29.85
Composite 6	B	26	12/16/2018 12:44:27	11.2	9.40	102.4	7.85	44482	28.64
Composite 6	C	26	12/16/2018 12:44:49	11.3	8.80	96.5	7.79	46001	29.73
Composite 6	D	26	12/16/2018 12:45:12	11.6	9.11	99.9	7.82	44369	28.58
Composite 6	E	26	12/16/2018 12:45:37	11.5	9.12	99.7	7.81	44371	28.57
Laboratory Control	A	27	12/17/2018 12:07:39	11.2	8.20	91.7	7.72	46579	30.14
Laboratory Control	B	27	12/17/2018 12:08:04	11.4	9.13	102.5	7.79	46555	30.13
Laboratory Control	C	27	12/17/2018 12:08:24	11.5	9.11	102.5	7.81	46838	30.34
Laboratory Control	D	27	12/17/2018 12:08:46	11.4	9.05	101.6	7.81	46763	30.28
Laboratory Control	E	27	12/17/2018 12:09:07	11.4	9.15	102.7	7.82	46813	30.32
CLDS Reference	A	27	12/17/2018 12:09:28	11.4	9.00	101.2	7.82	46930	30.40
CLDS Reference	B	27	12/17/2018 12:09:50	11.1	8.97	100.0	7.82	46757	30.26
CLDS Reference	C	27	12/17/2018 12:10:09	11.4	9.02	101.5	7.82	46917	30.39
CLDS Reference	D	27	12/17/2018 12:10:26	11.5	8.89	100.1	7.82	46901	30.39
CLDS Reference	E	27	12/17/2018 12:10:39	11.5	8.91	100.5	7.82	46937	30.41
Composite 2	A	27	12/17/2018 12:11:05	11.4	8.68	97.5	7.82	46847	30.34
Composite 2	B	27	12/17/2018 12:11:37	11.5	8.59	96.8	7.82	46932	30.41
Composite 2	C	27	12/17/2018 12:11:56	11.4	8.87	99.9	7.83	46917	30.40
Composite 2	D	27	12/17/2018 12:12:28	11.4	8.79	98.8	7.82	46960	30.42
Composite 2	E	27	12/17/2018 12:12:56	11.6	8.79	99.3	7.83	47068	30.51
Composite 3	A	27	12/17/2018 12:13:16	11.4	8.74	98.3	7.83	46871	30.36
Composite 3	B	27	12/17/2018 12:13:37	11.4	8.74	98.3	7.83	46875	30.36
Composite 3	C	27	12/17/2018 12:13:59	11.3	8.24	92.3	7.80	46791	30.30
Composite 3	D	27	12/17/2018 12:14:21	11.2	8.86	99.0	7.82	46694	30.22
Composite 3	E	27	12/17/2018 12:14:43	11.5	8.78	99.0	7.83	46971	30.44
Composite 4	A	27	12/17/2018 12:15:04	11.5	8.76	98.8	7.83	46952	30.42
Composite 4	B	27	12/17/2018 12:15:26	11.3	8.66	97.1	7.81	46687	30.22
Composite 4	C	27	12/17/2018 12:15:41	11.5	8.76	98.9	7.82	46970	30.44
Composite 4	D	27	12/17/2018 12:16:00	11.5	8.78	99.0	7.82	46960	30.43
Composite 4	E	27	12/17/2018 12:16:16	11.5	8.83	99.6	7.83	46988	30.45
Composite 5	A	27	12/17/2018 12:16:52	11.4	8.84	99.4	7.84	46849	30.34
Composite 5	B	27	12/17/2018 12:17:14	11.5	8.64	97.3	7.82	46914	30.39
Composite 5	C	27	12/17/2018 12:17:33	11.5	8.73	98.2	7.84	46890	30.38
Composite 5	D	27	12/17/2018 12:17:52	11.4	8.81	99.2	7.84	46856	30.35
Composite 5	E	27	12/17/2018 12:18:06	11.6	8.73	98.5	7.84	46976	30.44
Composite 6	A	27	12/17/2018 12:18:30	11.0	9.04	101.2	7.82	48093	31.22
Composite 6	B	27	12/17/2018 12:18:52	11.2	9.06	101.4	7.83	46819	30.31
Composite 6	C	27	12/17/2018 12:19:09	11.2	8.62	96.8	7.79	47855	31.06
Composite 6	D	27	12/17/2018 12:19:28	11.8	8.79	99.6	7.82	47010	30.48
Composite 6	E	27	12/17/2018 12:19:50	11.6	8.82	99.5	7.82	46906	30.39
Laboratory Control	A	28	12/18/2018 08:48:04	11.1	8.35	92.0	7.70	45631	29.46
Laboratory Control	B	28	12/18/2018 08:48:32	11.3	9.29	102.9	7.78	45708	29.52
Laboratory Control	C	28	12/18/2018 08:49:24	11.3	9.26	102.6	7.83	46022	29.74
Laboratory Control	D	28	12/18/2018 08:49:37	11.2	9.25	102.2	7.83	45956	29.69

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor
ASSAY: *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	11.4	8.68	95.6		45674	29.51
Minimum:	10.8	3.74	41.1	7.32	22060	13.29
Maximum:	12.2	9.56	104.8	8.02	49305	32.12

Field ID	Replicate	Day	DateTime M/D/Y	Temp C	DO mg/L	DO % Sat	pH SU	SpCond uS/cm	Salinity ppt
Laboratory Control	E	28	12/18/2018 08:49:58	11.1	9.30	102.8	7.83	45993	29.72
CLDS Reference	A	28	12/18/2018 08:50:17	11.1	9.17	101.3	7.82	46063	29.77
CLDS Reference	B	28	12/18/2018 08:50:37	10.9	9.13	100.3	7.82	45941	29.67
CLDS Reference	C	28	12/18/2018 08:51:41	11.2	9.05	100.0	7.83	46068	29.77
CLDS Reference	D	28	12/18/2018 08:52:05	11.2	8.89	98.4	7.82	46049	29.76
CLDS Reference	E	28	12/18/2018 08:52:27	11.2	9.00	99.7	7.83	46080	29.78
Composite 2	A	28	12/18/2018 08:52:49	11.2	8.65	95.6	7.82	46021	29.74
Composite 2	B	28	12/18/2018 08:53:11	11.1	8.48	93.7	7.82	46085	29.78
Composite 2	C	28	12/18/2018 08:53:33	11.2	8.92	98.7	7.83	46109	29.80
Composite 2	D	28	12/18/2018 08:54:43	11.4	8.85	98.2	7.83	46107	29.81
Composite 2	E	28	12/18/2018 08:55:03	11.4	8.76	97.4	7.84	46118	29.82
Composite 3	A	28	12/18/2018 08:55:25	11.3	8.84	97.9	7.83	46035	29.75
Composite 3	B	28	12/18/2018 08:55:42	11.3	8.84	97.9	7.83	46038	29.76
Composite 3	C	28	12/18/2018 08:56:03	11.2	8.10	89.5	7.79	45957	29.69
Composite 3	D	28	12/18/2018 08:56:25	11.0	9.06	99.8	7.83	45836	29.60
Composite 3	E	28	12/18/2018 08:56:45	11.4	8.90	98.8	7.84	46089	29.80
Composite 4	A	28	12/18/2018 08:57:07	11.4	8.92	99.1	7.84	46089	29.80
Composite 4	B	28	12/18/2018 08:57:27	11.2	8.73	96.5	7.81	45855	29.62
Composite 4	C	28	12/18/2018 08:57:49	11.4	8.87	98.6	7.83	46105	29.81
Composite 4	D	28	12/18/2018 08:58:10	11.3	8.85	98.2	7.82	46077	29.79
Composite 4	E	28	12/18/2018 08:58:32	11.4	8.88	98.7	7.83	46143	29.84
Composite 5	A	28	12/18/2018 08:59:54	11.3	9.01	99.7	7.85	46049	29.76
Composite 5	B	28	12/18/2018 09:00:14	11.3	8.57	95.0	7.82	46069	29.78
Composite 5	C	28	12/18/2018 09:00:36	11.3	8.86	98.3	7.85	46052	29.77
Composite 5	D	28	12/18/2018 09:00:57	11.4	8.84	98.1	7.85	46035	29.76
Composite 5	E	28	12/18/2018 09:01:19	11.5	8.73	97.1	7.85	46097	29.81
Composite 6	A	28	12/18/2018 09:02:37	10.8	9.25	102.0	7.84	47122	30.51
Composite 6	B	28	12/18/2018 09:02:59	10.9	9.24	101.6	7.85	46037	29.74
Composite 6	C	28	12/18/2018 09:03:16	11.1	8.86	98.1	7.82	46796	30.29
Composite 6	D	28	12/18/2018 09:03:41	11.7	8.81	98.5	7.83	46095	29.82
Composite 6	E	28	12/18/2018 09:04:03	11.5	8.87	98.8	7.83	46071	29.79

Nereis virens
28 day Bioaccumulation Evaluation
Statistical Analysis Reports
Survival

CETIS Test Data Worksheet

Report Date: 27 Dec-18 10:45 (p 1 of 1)
Test Code/ID: 01-9484-6514/31250Nv-Surv

Bioaccumulation Evaluation - Survival Endpoint			EnviroSystems, Inc.		
Start Date: 20 Nov-18 12:00	Species: Nereis virens	Sample Code: 31250-000			
End Date: 18 Dec-18 12:00	Protocol: US ACE NED RIM (2004)	Sample Source: New Haven Harbor 2018			
Sample Date: 20 Nov-18	Material: Laboratory Control Sediment	Sample Station: Laboratory Control (Nv)			

Sample	Rep	Pos	# Exposed	# Survived	Notes
31250-000	1	4	20	19	
31250-000	2	10	21	21	
31250-000	3	20	20	20	
31250-000	4	28	20	19	
31250-000	5	31	20	18	
31242-008	1	7	20	20	
31242-008	2	9	20	20	
31242-008	3	19	20	19	
31242-008	4	23	20	20	
31242-008	5	29	20	19	
31243-101	1	3	20	20	
31243-101	2	14	20	20	
31243-101	3	15	20	19	
31243-101	4	26	20	20	
31243-101	5	33	20	17	
31243-102	1	2	22	22	
31243-102	2	13	20	19	
31243-102	3	17	20	20	
31243-102	4	24	20	19	
31243-102	5	30	20	19	
31243-103	1	6	20	20	
31243-103	2	8	20	20	
31243-103	3	18	20	19	
31243-103	4	22	20	19	
31243-103	5	32	20	19	
31243-104	1	1	20	19	
31243-104	2	12	20	19	
31243-104	3	21	20	19	
31243-104	4	27	20	18	
31243-104	5	34	20	18	
31243-105	1	5	20	20	
31243-105	2	11	20	19	
31243-105	3	16	20	17	
31243-105	4	25	20	20	
31243-105	5	35	20	18	

CETIS Summary Report

Report Date: 28 Dec-18 10:37 (p 1 of 1)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint				EnviroSystems, Inc.
Batch ID: 21-3034-5200	Test Type: Survival	Analyst: Nancy Roka		
Start Date: 20 Nov-18 12:00	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable		
Ending Date: 18 Dec-18 12:00	Species: Nereis virens	Brine: Not Applicable		
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:		

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31250-000	17-4527-5443	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h		
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31250-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Nv)	
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
02-1554-3400	Proportion Survived	Equal Variance t Two-Sample Test	0.7898	31242-008 passed proportion survived
19-4330-8774	Proportion Survived	Equal Variance t Two-Sample Test	0.2983	31243-101 passed proportion survived
16-6263-9919	Proportion Survived	Equal Variance t Two-Sample Test	0.3005	31243-102 passed proportion survived
03-7312-9950	Proportion Survived	Equal Variance t Two-Sample Test	0.2898	31243-103 passed proportion survived
01-0555-6310	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.0397	31243-104 failed proportion survived
02-6908-1986	Proportion Survived	Equal Variance t Two-Sample Test	0.1305	31243-105 passed proportion survived

Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-000	LC	5	0.960	0.908	1.000	0.900	1.000	0.019	0.042	4.36%	0.00%
31242-008	RS	5	0.980	0.946	1.000	0.950	1.000	0.012	0.027	2.79%	-2.08%
31243-101		5	0.960	0.879	1.000	0.850	1.000	0.029	0.065	6.79%	0.00%
31243-102		5	0.970	0.936	1.000	0.950	1.000	0.012	0.027	2.82%	-1.04%
31243-103		5	0.970	0.936	1.000	0.950	1.000	0.012	0.027	2.82%	-1.04%
31243-104		5	0.930	0.896	0.964	0.900	0.950	0.012	0.027	2.94%	3.12%
31243-105		5	0.940	0.859	1.000	0.850	1.000	0.029	0.065	6.94%	2.08%

Proportion Survived Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31250-000	LC	0.950	1.000	1.000	0.950	0.900
31242-008	RS	1.000	1.000	0.950	1.000	0.950
31243-101		1.000	1.000	0.950	1.000	0.850
31243-102		1.000	0.950	1.000	0.950	0.950
31243-103		1.000	1.000	0.950	0.950	0.950
31243-104		0.950	0.950	0.950	0.900	0.900
31243-105		1.000	0.950	0.850	1.000	0.900

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 1 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 02-1554-3400		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:36		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-000	17-4527-5443	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-000	Laboratory Control Sediment	New Haven Harbor 2018	Laboratory Control (Nv)								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Angular (Corrected)	C > T	31242-008 passed proportion survived	4.32%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Lab Control Sedime		Reference Sed	-0.849	1.86	0.091	8	CDF	0.7898	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.69	2.29	0.6999	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004285	0.004285	1	0.721	0.4204	Non-Significant Effect					
Error	0.0475293	0.0059412	8								
Total	0.0518143		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.08	23.2	0.4967	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.918	0.741	0.3406	Normal Distribution						
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-000	LC	5	0.960	0.908	1.000	0.950	0.900	1.000	0.019	4.36%	0.00%
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	-2.08%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-000	LC	5	1.37	1.26	1.48	1.35	1.25	1.46	0.04	6.53%	0.00%
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	-3.02%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-000	LC	0.950	1.000	1.000	0.950	0.900					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-000	LC	1.35	1.46	1.46	1.35	1.25					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 2 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID:	19-4330-8774		Endpoint:	Proportion Survived			CETIS Version:	CETISv1.9.3			
Analyzed:	28 Dec-18 10:37		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Angular (Corrected)	C > T	31243-101 passed proportion survived					5.41%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.551	1.86	0.116	8	CDF	0.2983	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.21	2.29	0.0825	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0029648	0.0029648	1	0.304	0.5966	Non-Significant Effect					
Error	0.0780693	0.0097587	8								
Total	0.0810341		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.05	23.2	0.2040	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0300	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31243-101		5	0.960	0.879	1.000	1.000	0.850	1.000	0.029	6.79%	2.04%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31243-101		5	1.38	1.22	1.53	1.46	1.17	1.46	0.056	9.07%	2.44%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
31243-101		1.000	1.000	0.950	1.000	0.850					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					
31243-101		1.46	1.46	1.35	1.46	1.17					

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 3 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 16-6263-9919		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:37		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Angular (Corrected)	C > T			31243-102 passed proportion survived				3.33%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.544	1.86	0.074	8	CDF	0.3005	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.22	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0011716		0.0011716	1	0.296	0.6011	Non-Significant Effect				
Error	0.0316389		0.0039549	8							
Total	0.0328105			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.05	23.2	0.9652	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.805	0.741	0.0168	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31243-102		5	0.970	0.936	1.000	0.950	0.950	1.000	0.012	2.82%	1.02%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31243-102		5	1.39	1.31	1.47	1.35	1.35	1.46	0.0284	4.57%	1.53%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
31243-102		1.000	0.950	1.000	0.950	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					
31243-102		1.46	1.35	1.46	1.35	1.35					

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 4 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 03-7312-9950		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:37		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-103 passed proportion survived					3.29%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0.577	1.86	0.073	8	CDF	0.2898	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.16	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0012877		0.0012877	1	0.333	0.5796	Non-Significant Effect				
Error	0.0309042		0.0038630	8							
Total	0.0321919			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.799	0.741	0.0142	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31243-103		5	0.970	0.936	1.000	0.950	0.950	1.000	0.012	2.82%	1.02%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31243-103		5	1.39	1.31	1.47	1.35	1.35	1.46	0.0278	4.47%	1.61%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
31243-103		1.000	1.000	0.950	0.950	0.950					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					
31243-103		1.46	1.46	1.35	1.35	1.35					

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 5 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID:	01-0555-6310		Endpoint:	Proportion Survived			CETIS Version:	CETISv1.9.3			
Analyzed:	28 Dec-18 10:37		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Angular (Corrected)	C > T	31243-104 failed proportion survived					3.05%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	18	n/a	1	8	Exact	0.0397	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.25	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0283984	0.0283984	1	8.55	0.0192	Significant Effect					
Error	0.026566	0.0033208	8								
Total	0.0549644		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.39	23.2	0.7572	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.7	0.741	8.8E-04	Non-Normal Distribution						
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31243-104		5	0.930	0.896	0.964	0.950	0.900	0.950	0.012	2.94%	5.10%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31243-104		5	1.31	1.24	1.37	1.35	1.25	1.35	0.0236	4.03%	7.54%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
31243-104		0.950	0.950	0.950	0.900	0.900					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					
31243-104		1.35	1.35	1.35	1.25	1.25					

CETIS Analytical Report

Report Date: 28 Dec-18 10:37 (p 6 of 6)
Test Code: 31250Nv-Surv | 01-9484-6514

Bioaccumulation Evaluation - Survival Endpoint							EnviroSystems, Inc.				
Analysis ID: 02-6908-1986		Endpoint: Proportion Survived			CETIS Version: CETISv1.9.3						
Analyzed: 28 Dec-18 10:37		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Angular (Corrected)	C > T			31243-105 passed proportion survived					5.48%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	1.21	1.86	0.117	8	CDF	0.1305	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.6022	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0145847		0.0145847	1	1.46	0.2610	Non-Significant Effect				
Error	0.0797712		0.0099714	8							
Total	0.0943559			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.16	23.2	0.1961	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.932	0.741	0.4648	Normal Distribution				
Proportion Survived Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.980	0.946	1.000	1.000	0.950	1.000	0.012	2.79%	0.00%
31243-105		5	0.940	0.859	1.000	0.950	0.850	1.000	0.029	6.94%	4.08%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.41	1.34	1.49	1.46	1.35	1.46	0.0278	4.40%	0.00%
31243-105		5	1.34	1.18	1.49	1.35	1.17	1.46	0.0567	9.48%	5.40%
Proportion Survived Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.000	1.000	0.950	1.000	0.950					
31243-105		1.000	0.950	0.850	1.000	0.900					
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.46	1.46	1.35	1.46	1.35					
31243-105		1.46	1.35	1.17	1.46	1.25					

Macoma nasuta and *Nereis virens*
28 day Bioaccumulation Evaluation
Tissue Chemistry Chains of Custody



CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES												
Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	B567PreMnA	12/21/18	10:15	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
002	B567PreMnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
003	B567PreMnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
004	B567PreMnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
005	B567PreMnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
006	B567LabMnA	12/21/18	09:30	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
007	B567LabMnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
008	B567LabMnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
009	B567LabMnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
010	B567LabMnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
011	B567R01MnA	12/21/18	09:30	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
012	B567R01MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C

Relinquished By:	Date: 12/26/18	Time: 1100	Received By:	Date: 12/26/18	Time: 1100
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments: _____

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COC Number: A1017071

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CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
013	B567R01MnC	12/21/18	0930	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
014	B567R01MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
015	B567R01MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
016	B567S01MnA	12/21/18	10:05	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
017	B567S01MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
018	B567S01MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
019	B567S01MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
020	B567S01MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
021	B567S02MnA	12/21/18	10:45	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
022	B567S02MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
023	B567S02MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
024	B567S02MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C

Relinquished By:	Date: 12/20/18	Time: 1100	Received By:	Date: 12/26/18	Time: 1100
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments: _____

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COC Number: A1017071

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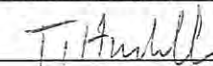


CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mo)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	Container		Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:	
						No	Size (mL)					
025	B567S02MnE	12/21/18	1045	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
026	B567S03MnA	12/21/18	1115	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
027	B567S03MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
028	B567S03MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
029	B567S03MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
030	B567S03MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
031	B567S04MnA	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
032	B567S04MnB	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
033	B567S04MnC	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
034	B567S04MnD	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
035	B567S04MnE	12/21/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
036	B567S05MnA	12/21/18	1230	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C

Relinquished By: 	Date: 12/26/18	Time: 1100	Received By: 	Date: 12/26/18	Time: 1102
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments: _____

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COC Number: A1017071

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CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31249 (Mn)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy.com ERR	

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container		Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
							Size (mL)	Type (P/G/T)				
037	B567S05MnB	12/21/18	12:30	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
038	B567S05MnC	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
039	B567S05MnD	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
040	B567S05MnE	12/21/18	↓	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C

Relinquished By: Date: 12/26/18 Time: 1100	Received By: Date: 12/26/18 Time: 1100
Relinquished By: _____ Date: _____ Time: _____	Received at Lab By: _____ Date: _____ Time: _____

Comments: _____

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COC Number: A1017071

Sample Delivery Group No: December 2018	Page _____ of _____
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CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250(N)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy.com ERR	

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	Container		Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:	
						No	Size (mL)					
001	B567PreNvA	12/20/18	0900	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
002	B567PreNvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
003	B567PreNvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
004	B567PreNvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
005	B567PreNvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
006	B567LabNvA	12/20/18	0915	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
007	B567LabNvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
008	B567LabNvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
009	B567LabNvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
010	B567LabNvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
011	B567R01NvA	12/20/18	0930	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
012	B567R01NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C

Relinquished By:	Date: 12/20/18	Time: 1100	Received By:	Date: 12/20/18	Time: 1600
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments:

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COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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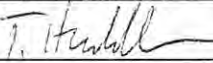


CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250 (N)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalp	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
013	B567R01NvC	12/20/18	09:30	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
014	B567R01NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
015	B567R01NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
016	B567S01NvA	12/20/18	09:45	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
017	B567S01NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
018	B567S01NvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
019	B567S01NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
020	B567S01NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
021	B567S02NvA	12/20/18	10:00	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
022	B567S02NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
023	B567S02NvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C
024	B567S02NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As,C

Relinquished By: 	Date: 12/26/18	Time: 11:00	Received By: 	Date: 12/26/18	Time: 11:00
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments:

ERR

COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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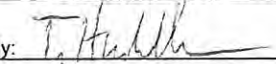


CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250(NJ)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy.com ERR	

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
025	B567S02NvE	12/20/18	1000	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
026	B567S03NvA	12/20/18	1015	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
027	B567S03NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
028	B567S03NvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
029	B567S03NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
030	B567S03NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
031	B567S04NvA	12/20/18	1030	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
032	B567S04NvB	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
033	B567S04NvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
034	B567S04NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
035	B567S04NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
036	B567S05NvA	12/20/18	1045	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C

Relinquished By: 	Date: 12/20/18	Time: 1100	Received By: 	Date: 12/20/18	Time: 1100
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments: _____

ERR

COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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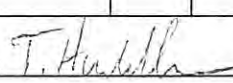


CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Alexandra MacKinnon	Project Name: AECOM - New Haven Harbor 2018	31250 (N.)
Report to: Alexandra MacKinnon	Address: P.O. Box 778	Project Number: P0816	Task: 0001
Invoice to: Alexandra MacKinnon	Address: Hampton, NH 03843	Project Manager: Alexandra MacKinnon	
Voice: 0	Fax: 0	email: alexandra.mackinnon@enthalpy	ERR

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
037	B567S05NvB	12/20/18	1045	ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
038	B567S05NvC	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
039	B567S05NvD	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
040	B567S05NvE	12/20/18		ESI	C	1	9 oz	G	Frozen	Tissue	N	%Lipids,TS%,PAH680,Pest8081,CGR680>Total Metals As.C
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							
				ESI	C							

Relinquished By: 	Date: 12/26/18	Time: 1100	Received By: 	Date: 12/26/18	Time: 1100
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:

Comments: _____

ERR

COC Number: A1017071

Sample Delivery Group No:	December 2018	Page	of
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Nancy Roka <nancy.roka@enthalpy.com>

/Tissue Reporting

Fri, Mar 30, 2018 at 10:17 AM

To: Nancy Roka <nroka@envirosystems.com>, "Kirk Cram (kirk.cram@enthalpy.com)" <kirk.cram@enthalpy.com>, "nancy.roka@enthalpy.com" <nancy.roka@enthalpy.com>

Good morning Nancy -

Please see the below confirmation just received from NAE regarding the handling of statistics under their recently requested "totals" calculation protocol. Please proceed using the below guidance and let us know if any questions etc

Best

Kris

-----Original Message-----

From: Loyd, Richard B CIV USARMY CENAE (US) [mailto:Richard.B.Loyd@usace.army.mil]

Sent: Friday, March 30, 2018 10:12 AM

To:

Cc

Subject: RE: /Tissue Reporting

Hey there Maura,

I agree with ESI's recommendation to use 1/2 MDL for non-detects for both the computation of totals and for statistical analysis. It took a little while to get you an answer because I was waiting on a call back from our regulatory office to make sure they were ok with that methodology as well. In future ESI should follow the proposed protocol for both federal and private projects.

Thanks,

Ben

Richard B. Loyd
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742
Office: (978) 318-8048
Cell: (978) 763-5438
Richard.B.Loyd@usace.army.mil

-----Original Message-----

From:

Sent: Wednesday, March 28, 2018 4:56 PM

To: Loyd, Richard B CIV USARMY CENAE (US) <Richard.B.Loyd@usace.army.mil>

Subject: [Non-DoD Source] /Tissue Reporting

Ben,

Based on the recent directive regarding reporting on non-detects and summation of totals, we have some further questions regarding statistical evaluation. The issue, paraphrased from ESI is as follows:

"Historically the Bioaccumulation EDD, where totals for PCBs etc are provided, uses the MDL when a value is a non-detect "ND" and the statistical analysis on the individual compounds are run using the MDL in place of the ND. Going forward, as per direction from USACE, we will use 1/2 of the MDL to compute the "Total" concentration for specified compounds. Under this scenario what number should be incorporated into the statistical analysis program, the 1/2 MDL or the MDL? As indicated, the "Total" numbers have not been included in the statistical analysis historically. However, a potential issue arises if the stats were run using the MDL then a review of the full data package differs shows different numbers which could potentially lead to some level of confusion. ESI's suggestion would be to use the 1/2 MDL for the computation of totals and for the statistical analysis, for those groups where total are generated, PCBs, Pesticides and PAHs.

Do you concur with ESI's recommendation?

Thanks Ben,

Maura

-----Original Message-----

From: Loyd, Richard B CIV USARMY CENAE (US) [mailto:Richard.B.Loyd@usace.army.mil]

<mailto:Richard.B.Loyd@usace.army.mil>]

Sent: Monday, March 26, 2018 2:28 PM

To:

Cc:

Subject: RE: Draft Report

Hello Kris,

I realize that the reporting methods we requested are in conflict with the guidance of the RIM and the 2009 errata. The 2009 errata is the most recent RIM update. Please stick to the guidance we gave you in our last conference call, which is summarized below:

- Please continue to report NDs as the full RL. We are in the process of changing our methods to report NDs as the full MDL, but this change might not take place in the near future.

- For totals calculations (PCBs, DDT, PAHs) please use 1/2 the MDL for NDs. Please remember that PCB totals are calculated using only the NOAA 18 congeners. Also, despite what the errata guidance, please continue to calculate PCB totals for sediment chemistry.

Thanks,

Ben

Richard B. Loyd

US Army Corps of Engineers

696 Virginia Road

Concord, MA 01742

Office: (978) 318-8048

Cell: (978) 763-5438

Richard.B.Loyd@usace.army.mil <mailto:Richard.B.Loyd@usace.army.mil>

Macoma nasuta
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
Trace Metals

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
Metals (ug/g wet weight)						
Arsenic	1.8		2.0		1.7	
Cadmium	0.030	J	0.031	J	0.025	J
Chromium	0.46		0.50		0.43	
Copper	1.5		1.8		1.5	
Lead	0.27		0.30		0.26	
Mercury	0.0030	J	0.0040	J	0.0040	J
Nickel	0.38		0.41		0.35	
Zinc	11.1		9.9		8.3	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	2.8		2.1		1.9		2.6		2.3	
Cadmium	0.030	J	0.023	J	0.023	J	0.026	J	0.020	J
Chromium	0.39		0.44		0.31	J	0.68		0.61	
Copper	2.0		1.8		2.0		1.9		2.1	
Lead	0.41		0.42		0.37		0.54		0.56	
Mercury	0.0080	J	0.0050	J	0.0050	J	0.0070	J	0.0070	J
Nickel	0.42		0.44		0.32		0.48		0.44	
Zinc	10.5		8.3		10.2		10.1		8.1	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.9		1.9		1.9		1.2		2.5	
Cadmium	0.024	J	0.028	J	0.031	J	0.033	J	0.032	J
Chromium	0.45		0.40		0.55		0.45		0.51	
Copper	2.0		2.2		2.0		2.2		2.0	
Lead	0.43		0.42		0.62		0.33		0.45	
Mercury	0.0040	J	0.0030	J	0.0040	J	0.0015	U	0.0030	J
Nickel	0.29		0.32		0.37		0.28		0.42	
Zinc	7.6		11.2		10.2		9.4		10.7	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	2.3		2.0		2.4		2.7		2.2	
Cadmium	0.025	J	0.022	J	0.038		0.028	J	0.023	J
Chromium	0.36	J	0.36		0.51		0.42		0.27	J
Copper	2.0		2.1		2.3		2.0		1.9	
Lead	0.40		0.38		0.47		0.44		0.29	
Mercury	0.0015	U	0.0015	U	0.0030	J	0.0015	U	0.0015	U
Nickel	0.33		0.35		0.44		0.35		0.32	
Zinc	10.5		8.7		13.6		10.6		10.3	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.8		2.3		1.9		1.4		1.9	
Cadmium	0.023	J	0.024	J	0.028	J	0.022	J	0.030	J
Chromium	0.39		0.41		0.59		0.42		0.51	
Copper	2.2		1.9		2.6		2.0		2.2	
Lead	0.35		0.37		0.45		0.37		0.44	
Mercury	0.0030	J	0.0015	U	0.0015	U	0.0015	U	0.0040	J
Nickel	0.26		0.35		0.41		0.29		0.36	
Zinc	8.0		10.4		8.9		7.7		10.4	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.9		2.1		2.0		1.8		1.5	
Cadmium	0.023	J	0.029	J	0.033	J	0.027	J	0.019	J
Chromium	0.31	J	0.38		0.30	J	0.27	J	0.35	J
Copper	1.8		1.5		1.5		1.5		1.4	
Lead	0.28		0.38		0.28		0.25		0.36	
Mercury	0.0015	U	0.0015	U	0.0015	U	0.0040	J	0.0015	U
Nickel	0.30		0.34		0.33		0.30		0.31	
Zinc	8.7		9.5		9.3		9.0		7.6	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.9		1.7		1.8		1.6		1.6	
Cadmium	0.022	J	0.031	J	0.031	J	0.028	J	0.028	J
Chromium	0.36		0.93		0.43		0.36		0.36	
Copper	2.3		2.7		2.3		1.9		1.8	
Lead	0.58		0.79		0.56		0.52		0.57	
Mercury	0.0080	J	0.0090	J	0.0060	J	0.0070	J	0.0070	J
Nickel	0.34		0.45		0.37		0.30		0.31	
Zinc	8.5		10.0		11.5		9.8		8.4	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 13:42 (p 1 of 1)

Test Code/ID: 12-9274-1446/31249Mn-Met

Bioaccumulation Evaluation - Metals - Macoma **EnviroSystems, Inc.**

Start Date: 21 Nov-18 12:01 **Species:** Macoma nasuta **Sample Code:** 31249-000
End Date: 19 Dec-18 12:01 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 21 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Mn)

Sample	Rep	Pos	Body Burden	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Silver
31242-008	1	4		2.8	0.03	0.39	2	0.41	0.008	0.42	10.5	
31242-008	2	11		2.1	0.023	0.44	1.8	0.42	0.005	0.44	8.3	
31242-008	3	18		1.9	0.023	0.31	2	0.37	0.005	0.32	10.2	
31242-008	4	24		2.6	0.026	0.68	1.9	0.54	0.007	0.48	10.1	
31242-008	5	29		2.3	0.02	0.61	2.1	0.56	0.007	0.44	8.1	
31243-101	1	6		1.9	0.024	0.45	2	0.43	0.004	0.29	7.6	
31243-101	2	12		1.9	0.028	0.4	2.2	0.42	0.003	0.32	11.2	
31243-101	3	13		1.9	0.031	0.55	2	0.62	0.004	0.37	10.2	
31243-101	4	21		1.2	0.033	0.45	2.2	0.33	0.0015	0.28	9.4	
31243-101	5	25		2.5	0.032	0.51	2	0.45	0.003	0.42	10.7	
31243-102	1	2		2.3	0.025	0.36	2	0.4	0.0015	0.33	10.5	
31243-102	2	8		2	0.022	0.36	2.1	0.38	0.0015	0.35	8.7	
31243-102	3	17		2.4	0.038	0.51	2.3	0.47	0.003	0.44	13.6	
31243-102	4	19		2.7	0.028	0.42	2	0.44	0.0015	0.35	10.6	
31243-102	5	27		2.2	0.023	0.27	1.9	0.29	0.0015	0.32	10.3	
31243-103	1	5		1.8	0.023	0.39	2.2	0.35	0.003	0.26	8	
31243-103	2	7		2.3	0.024	0.41	1.9	0.37	0.0015	0.35	10.4	
31243-103	3	16		1.9	0.028	0.59	2.6	0.45	0.0015	0.41	8.9	
31243-103	4	22		1.4	0.022	0.42	2	0.37	0.0015	0.29	7.7	
31243-103	5	28		1.9	0.03	0.51	2.2	0.44	0.004	0.36	10.4	
31243-104	1	1		1.9	0.023	0.31	1.8	0.28	0.0015	0.3	8.7	
31243-104	2	9		2.1	0.029	0.38	1.5	0.38	0.0015	0.34	9.5	
31243-104	3	14		2	0.033	0.3	1.5	0.28	0.0015	0.33	9.3	
31243-104	4	23		1.8	0.027	0.27	1.5	0.25	0.004	0.3	9	
31243-104	5	26		1.5	0.019	0.35	1.4	0.36	0.0015	0.31	7.6	
31243-105	1	3		1.9	0.022	0.36	2.3	0.58	0.008	0.34	8.5	
31243-105	2	10		1.7	0.031	0.93	2.7	0.79	0.009	0.45	10	
31243-105	3	15		1.8	0.031	0.43	2.3	0.56	0.006	0.37	11.5	
31243-105	4	20		1.6	0.028	0.36	1.9	0.52	0.007	0.3	9.8	
31243-105	5	30		1.6	0.028	0.36	1.8	0.57	0.007	0.31	8.4	

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 1 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma **EnviroSystems, Inc.**

Batch ID: 20-2290-9068	Test Type: Bioaccumulation - Metals	Analyst: Nancy Roka
Start Date: 21 Nov-18 12:01	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 19 Dec-18 12:01	Species: Macoma nasuta	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
04-2967-2273	Arsenic	Equal Variance t Two-Sample Test	0.9410	31243-101 passed arsenic
17-8457-1708	Arsenic	Equal Variance t Two-Sample Test	0.5386	31243-102 passed arsenic
06-7985-6353	Arsenic	Equal Variance t Two-Sample Test	0.9709	31243-103 passed arsenic
16-6681-9544	Arsenic	Equal Variance t Two-Sample Test	0.9812	31243-104 passed arsenic
09-7957-0265	Arsenic	Equal Variance t Two-Sample Test	0.9964	31243-105 passed arsenic
02-5097-2061	Cadmium	Equal Variance t Two-Sample Test	0.0289	31243-101 failed cadmium
03-0676-1861	Cadmium	Equal Variance t Two-Sample Test	0.2135	31243-102 passed cadmium
08-6268-0444	Cadmium	Equal Variance t Two-Sample Test	0.3366	31243-103 passed cadmium
20-4359-9124	Cadmium	Equal Variance t Two-Sample Test	0.2793	31243-104 passed cadmium
20-6343-1957	Cadmium	Equal Variance t Two-Sample Test	0.0827	31243-105 passed cadmium
04-2238-2526	Chromium	Equal Variance t Two-Sample Test	0.5728	31243-101 passed chromium
10-6598-3043	Chromium	Equal Variance t Two-Sample Test	0.8821	31243-102 passed chromium
17-8905-2944	Chromium	Equal Variance t Two-Sample Test	0.6066	31243-103 passed chromium
01-6324-5319	Chromium	Equal Variance t Two-Sample Test	0.9743	31243-104 passed chromium
11-5807-8577	Chromium	Equal Variance t Two-Sample Test	0.4941	31243-105 passed chromium
05-2085-3074	Copper	Equal Variance t Two-Sample Test	0.0641	31243-101 passed copper
01-8795-3351	Copper	Equal Variance t Two-Sample Test	0.1362	31243-102 passed copper
14-0357-0546	Copper	Equal Variance t Two-Sample Test	0.0650	31243-103 passed copper
00-5105-5445	Copper	Equal Variance t Two-Sample Test	0.9994	31243-104 passed copper
00-4258-3067	Copper	Equal Variance t Two-Sample Test	0.0968	31243-105 passed copper
13-2639-2316	Lead	Equal Variance t Two-Sample Test	0.5636	31243-101 passed lead
07-6922-1056	Lead	Equal Variance t Two-Sample Test	0.8872	31243-102 passed lead
06-9033-2205	Lead	Equal Variance t Two-Sample Test	0.9127	31243-103 passed lead
06-1939-2709	Lead	Equal Variance t Two-Sample Test	0.9945	31243-104 passed lead
17-2190-3102	Lead	Equal Variance t Two-Sample Test	0.0227	31243-105 failed lead
02-1030-4500	Mercury	Equal Variance t Two-Sample Test	0.9988	31243-101 passed mercury
16-6589-9510	Mercury	Equal Variance t Two-Sample Test	0.9999	31243-102 passed mercury
09-5296-1956	Mercury	Equal Variance t Two-Sample Test	0.9996	31243-103 passed mercury
07-6362-6041	Mercury	Equal Variance t Two-Sample Test	0.9998	31243-104 passed mercury
01-0104-8346	Mercury	Equal Variance t Two-Sample Test	0.1199	31243-105 passed mercury
01-7750-2713	Nickel	Equal Variance t Two-Sample Test	0.9723	31243-101 passed nickel
12-1132-2508	Nickel	Equal Variance t Two-Sample Test	0.9460	31243-102 passed nickel
08-4991-0214	Nickel	Equal Variance t Two-Sample Test	0.9739	31243-103 passed nickel

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 2 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
01-2571-5451	Nickel	Equal Variance t Two-Sample Test	1.0000	31243-104 passed nickel
20-3513-9465	Nickel	Equal Variance t Two-Sample Test	0.9970	31243-104 passed nickel
14-0352-2568	Nickel	Equal Variance t Two-Sample Test	0.9396	31243-105 passed nickel
18-4384-6194	Zinc	Equal Variance t Two-Sample Test	0.3260	31243-101 passed zinc
15-7056-8033	Zinc	Equal Variance t Two-Sample Test	0.1030	31243-102 passed zinc
06-0169-8430	Zinc	Equal Variance t Two-Sample Test	0.6740	31243-103 passed zinc
15-4472-5498	Zinc	Equal Variance t Two-Sample Test	0.8301	31243-104 passed zinc
07-0176-2888	Zinc	Equal Variance t Two-Sample Test	0.4001	31243-105 passed zinc

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 3 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma											EnviroSystems, Inc.
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	1.9	2.8	0.163	0.365	15.59%	0.00%
31243-101		5	1.88	1.31	2.45	1.2	2.5	0.206	0.46	24.49%	19.66%
31243-102		5	2.32	2	2.64	2	2.7	0.116	0.259	11.16%	0.85%
31243-103		5	1.86	1.46	2.26	1.4	2.3	0.144	0.321	17.25%	20.51%
31243-104		5	1.86	1.57	2.15	1.5	2.1	0.103	0.23	12.38%	20.51%
31243-105		5	1.72	1.56	1.88	1.6	1.9	0.0583	0.13	7.58%	26.50%
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.02	0.03	0.00169	0.00378	15.50%	0.00%
31243-101		5	0.0296	0.0251	0.0341	0.024	0.033	0.00163	0.00365	12.32%	-21.31%
31243-102		5	0.0272	0.0192	0.0352	0.022	0.038	0.00289	0.00646	23.74%	-11.48%
31243-103		5	0.0254	0.0211	0.0297	0.022	0.03	0.00154	0.00344	13.52%	-4.10%
31243-104		5	0.0262	0.0195	0.0329	0.019	0.033	0.00242	0.0054	20.62%	-7.38%
31243-105		5	0.028	0.0234	0.0326	0.022	0.031	0.00164	0.00367	13.12%	-14.75%
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.31	0.68	0.069	0.154	31.76%	0.00%
31243-101		5	0.472	0.399	0.545	0.4	0.55	0.0262	0.0585	12.39%	2.88%
31243-102		5	0.384	0.274	0.494	0.27	0.51	0.0396	0.0885	23.04%	20.99%
31243-103		5	0.464	0.36	0.568	0.39	0.59	0.0376	0.0841	18.13%	4.53%
31243-104		5	0.322	0.268	0.376	0.27	0.38	0.0193	0.0432	13.43%	33.74%
31243-105		5	0.488	0.179	0.797	0.36	0.93	0.111	0.249	51.01%	-0.41%
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	1.8	2.1	0.051	0.114	5.82%	0.00%
31243-101		5	2.08	1.94	2.22	2	2.2	0.049	0.11	5.27%	-6.12%
31243-102		5	2.06	1.87	2.25	1.9	2.3	0.0678	0.152	7.36%	-5.10%
31243-103		5	2.18	1.85	2.51	1.9	2.6	0.12	0.268	12.31%	-11.22%
31243-104		5	1.54	1.35	1.73	1.4	1.8	0.0678	0.152	9.85%	21.43%
31243-105		5	2.2	1.75	2.65	1.8	2.7	0.161	0.361	16.39%	-12.24%
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.37	0.56	0.0378	0.0846	18.38%	0.00%
31243-101		5	0.45	0.319	0.581	0.33	0.62	0.0472	0.106	23.47%	2.17%
31243-102		5	0.396	0.311	0.481	0.29	0.47	0.0308	0.0688	17.37%	13.91%
31243-103		5	0.396	0.339	0.453	0.35	0.45	0.0204	0.0456	11.52%	13.91%
31243-104		5	0.31	0.24	0.38	0.25	0.38	0.0253	0.0566	18.25%	32.61%
31243-105		5	0.604	0.472	0.736	0.52	0.79	0.0476	0.106	17.62%	-31.30%
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.005	0.008	0.0006	0.00134	20.96%	0.00%
31243-101		5	0.0031	0.00183	0.00437	0.0015	0.004	0.000458	0.00102	33.05%	51.56%
31243-102		5	0.0018	0.000967	0.00263	0.0015	0.003	0.0003	0.000671	37.27%	71.88%
31243-103		5	0.0023	0.000871	0.00373	0.0015	0.004	0.000515	0.00115	50.05%	64.06%
31243-104		5	0.002	0.000612	0.00339	0.0015	0.004	0.0005	0.00112	55.90%	68.75%
31243-105		5	0.0074	0.00598	0.00882	0.006	0.009	0.00051	0.00114	15.41%	-15.62%

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 4 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma											EnviroSystems, Inc.
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.32	0.48	0.0268	0.06	14.29%	0.00%
31243-101		5	0.336	0.263	0.409	0.28	0.42	0.0262	0.0586	17.43%	20.00%
31243-102		5	0.358	0.299	0.417	0.32	0.44	0.0213	0.0476	13.31%	14.76%
31243-103		5	0.334	0.26	0.408	0.26	0.41	0.0266	0.0594	17.79%	20.48%
31243-104		5	0.316	0.293	0.339	0.3	0.34	0.00812	0.0182	5.75%	24.76%
31243-105		5	0.354	0.279	0.429	0.3	0.45	0.0269	0.0602	17.02%	15.71%
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	8.1	10.5	0.511	1.14	12.12%	0.00%
31243-101		5	9.82	8.07	11.6	7.6	11.2	0.63	1.41	14.34%	-4.03%
31243-102		5	10.7	8.54	12.9	8.7	13.6	0.794	1.78	16.53%	-13.77%
31243-103		5	9.08	7.49	10.7	7.7	10.4	0.574	1.28	14.13%	3.81%
31243-104		5	8.82	7.89	9.75	7.6	9.5	0.334	0.746	8.46%	6.57%
31243-105		5	9.64	8.06	11.2	8.4	11.5	0.568	1.27	13.17%	-2.12%

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 5 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.
Arsenic Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.8	2.1	1.9	2.6	2.3	
31243-101		1.9	1.9	1.9	1.2	2.5	
31243-102		2.3	2	2.4	2.7	2.2	
31243-103		1.8	2.3	1.9	1.4	1.9	
31243-104		1.9	2.1	2	1.8	1.5	
31243-105		1.9	1.7	1.8	1.6	1.6	
Cadmium Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.03	0.023	0.023	0.026	0.02	
31243-101		0.024	0.028	0.031	0.033	0.032	
31243-102		0.025	0.022	0.038	0.028	0.023	
31243-103		0.023	0.024	0.028	0.022	0.03	
31243-104		0.023	0.029	0.033	0.027	0.019	
31243-105		0.022	0.031	0.031	0.028	0.028	
Chromium Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.39	0.44	0.31	0.68	0.61	
31243-101		0.45	0.4	0.55	0.45	0.51	
31243-102		0.36	0.36	0.51	0.42	0.27	
31243-103		0.39	0.41	0.59	0.42	0.51	
31243-104		0.31	0.38	0.3	0.27	0.35	
31243-105		0.36	0.93	0.43	0.36	0.36	
Copper Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2	1.8	2	1.9	2.1	
31243-101		2	2.2	2	2.2	2	
31243-102		2	2.1	2.3	2	1.9	
31243-103		2.2	1.9	2.6	2	2.2	
31243-104		1.8	1.5	1.5	1.5	1.4	
31243-105		2.3	2.7	2.3	1.9	1.8	
Lead Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.41	0.42	0.37	0.54	0.56	
31243-101		0.43	0.42	0.62	0.33	0.45	
31243-102		0.4	0.38	0.47	0.44	0.29	
31243-103		0.35	0.37	0.45	0.37	0.44	
31243-104		0.28	0.38	0.28	0.25	0.36	
31243-105		0.58	0.79	0.56	0.52	0.57	
Mercury Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.008	0.005	0.005	0.007	0.007	
31243-101		0.004	0.003	0.004	0.0015	0.003	
31243-102		0.0015	0.0015	0.003	0.0015	0.0015	
31243-103		0.003	0.0015	0.0015	0.0015	0.004	
31243-104		0.0015	0.0015	0.0015	0.004	0.0015	
31243-105		0.008	0.009	0.006	0.007	0.007	

CETIS Summary Report

Report Date: 05 Feb-19 15:36 (p 6 of 6)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma						EnviroSystems, Inc.
Nickel Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.42	0.44	0.32	0.48	0.44
31243-101		0.29	0.32	0.37	0.28	0.42
31243-102		0.33	0.35	0.44	0.35	0.32
31243-103		0.26	0.35	0.41	0.29	0.36
31243-104		0.3	0.34	0.33	0.3	0.31
31243-105		0.34	0.45	0.37	0.3	0.31
Zinc Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	10.5	8.3	10.2	10.1	8.1
31243-101		7.6	11.2	10.2	9.4	10.7
31243-102		10.5	8.7	13.6	10.6	10.3
31243-103		8	10.4	8.9	7.7	10.4
31243-104		8.7	9.5	9.3	9	7.6
31243-105		8.5	10	11.5	9.8	8.4

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Metals

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-1.75119	1.85955	0.9409905	0.05	FALSE	0.4884633	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	2.213267	1.85955	0.0288929	0.05	TRUE	0.00436895	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.18964	1.85955	0.5728427	0.05	FALSE	0.1372795	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	1.697057	1.85955	0.0640611	0.05	FALSE	0.1314899	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1652949	1.85955	0.5635937	0.05	FALSE	0.1124988	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-4.370956	1.85955	0.9988113	0.05	FALSE	0.00140393	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-2.240199	1.85955	0.9722959	0.05	FALSE	0.06972685	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0.4684576	1.85955	0.3259782	0.05	FALSE	1.508413	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.0999996	1.85955	0.5385973	0.05	FALSE	0.3719096	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.8366601	1.85955	0.2135335	0.05	FALSE	0.00622324	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.281828	1.85955	0.8820992	0.05	FALSE	0.1479714	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.178511	1.85955	0.1362278	0.05	FALSE	0.1577879	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.312976	1.85955	0.8871998	0.05	FALSE	0.09064224	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-6.857275	1.85955	0.999935	0.05	FALSE	0.00124742	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.809496	1.85955	0.9460131	0.05	FALSE	0.06371497	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.376297	1.85955	0.1030104	0.05	FALSE	1.756461	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-2.209379	1.85955	0.9709314	0.05	FALSE	0.4039972	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	0.4376882	1.85955	0.3365943	0.05	FALSE	0.00424857	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.2798069	1.85955	0.606638	0.05	FALSE	0.1462083	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	1.687323	1.85955	0.065011	0.05	FALSE	0.2424554	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-1.489581	1.85955	0.9126685	0.05	FALSE	0.07989568	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-5.186135	1.85955	0.9995818	0.05	FALSE	0.0014701	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-2.277396	1.85955	0.9738583	0.05	FALSE	0.07022103	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.468284	1.85955	0.6739624	0.05	FALSE	1.429556	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-2.488684	1.85955	0.9812003	0.05	FALSE	0.3586566	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.6102571	1.85955	0.2793122	0.05	FALSE	0.00548488	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-2.287506	1.85955	0.9742676	0.05	FALSE	0.1333181	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-4.949748	1.85955	0.9994394	0.05	FALSE	0.1577879	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-3.296902	1.85955	0.9945455	0.05	FALSE	0.08460433	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-5.633622	1.85955	0.9997547	0.05	FALSE	0.00145235	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-3.709557	1.85955	0.9970199	0.05	FALSE	0.05213371	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-8.966119	1.89458	0.9999781	0.05	FALSE	0.02725824	7		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-1.015167	1.85955	0.8301292	0.05	FALSE	1.135695	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-3.579571	1.85955	0.9964036	0.05	FALSE	0.3220831	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	1.52674	1.85955	0.082671	0.05	FALSE	0.00438475	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.0152677	1.85955	0.4940962	0.05	FALSE	0.2435937	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	1.41915	1.85955	0.0968107	0.05	FALSE	0.3144781	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	2.368626	1.85955	0.0226718	0.05	TRUE	0.1130507	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	1.270001	1.85955	0.1198881	0.05	FALSE	0.00146421	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-1.73564	1.85955	0.9395789	0.05	FALSE	0.07071174	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.2616669	1.85955	0.4000946	0.05	FALSE	1.421308	8		C

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 1 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-2967-2273		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed arsenic					20.87%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-1.75	1.86	0.488	8	CDF	0.9410	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.6102	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.529	0.529	1	3.07	0.1180	Non-Significant Effect					
Error	1.38	0.1725	8								
Total	1.909		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.59	23.2	0.6625	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.969	0.741	0.8824	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	2.3	1.9	2.8	0.163	15.59%	0.00%
31243-101		5	1.88	1.31	2.45	1.9	1.2	2.5	0.206	24.49%	19.66%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.8	2.1	1.9	2.6	2.3					
31243-101		1.9	1.9	1.9	1.2	2.5					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-8457-1708		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed arsenic					15.89%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.1	1.86	0.372	8	CDF	0.5386	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.54	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.01	0.9228	Non-Significant Effect				
Error	0.8		0.1	8							
Total	0.801			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.99	23.2	0.5230	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.966	0.741	0.8530	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	2.3	1.9	2.8	0.163	15.59%	0.00%
31243-102		5	2.32	2	2.64	2.3	2	2.7	0.116	11.16%	0.85%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.8	2.1	1.9	2.6	2.3					
31243-102		2.3	2	2.4	2.7	2.2					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-7985-6353		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed arsenic				17.26%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.21	1.86	0.404	8	CDF	0.9709	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.42	2.29	1.0000		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.576		0.576	1	4.88	0.0581		Non-Significant Effect			
Error	0.944		0.118	8							
Total	1.52			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			1.29	23.2	0.8103		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.936	0.741	0.5090		Normal Distribution			
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	2.3	1.9	2.8	0.163	15.59%	0.00%
31243-103		5	1.86	1.46	2.26	1.9	1.4	2.3	0.144	17.25%	20.51%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.8	2.1	1.9	2.6	2.3					
31243-103		1.8	2.3	1.9	1.4	1.9					

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Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-6681-9544		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed arsenic				15.33%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-2.49	1.86	0.359	8	CDF	0.9812	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.6	2.29	0.9076	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.576		0.576	1	6.19	0.0376	Significant Effect				
Error	0.744		0.093	8							
Total	1.32			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.51	23.2	0.3946	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.973	0.741	0.9196	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	2.3	1.9	2.8	0.163	15.59%	0.00%
31243-104		5	1.86	1.57	2.15	1.9	1.5	2.1	0.103	12.38%	20.51%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.8	2.1	1.9	2.6	2.3					
31243-104		1.9	2.1	2	1.8	1.5					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-7957-0265		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed arsenic				13.76%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-3.58	1.86	0.322	8	CDF	0.9964	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.78	2.29	0.5286	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.961	0.961	1	12.8	0.0072	Significant Effect					
Error	0.6	0.075	8								
Total	1.561		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			7.82	23.2	0.0712	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.989	0.741	0.9961	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	1.89	2.79	2.3	1.9	2.8	0.163	15.59%	0.00%
31243-105		5	1.72	1.56	1.88	1.7	1.6	1.9	0.0583	7.58%	26.50%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.8	2.1	1.9	2.6	2.3					
31243-105		1.9	1.7	1.8	1.6	1.6					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-5097-2061		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 failed cadmium					17.91%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.21	1.86	0.004	8	CDF	0.0289	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.6	2.29	0.9101	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000676		0.0000676	1	4.9	0.0578	Non-Significant Effect				
Error	0.0001104		0.0000138	8							
Total	0.000178			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.08	23.2	0.9457	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.966	0.741	0.8565	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.023	0.02	0.03	0.00169	15.50%	0.00%
31243-101		5	0.0296	0.0251	0.0341	0.031	0.024	0.033	0.00163	12.32%	-21.31%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.023	0.023	0.026	0.02					
31243-101		0.024	0.028	0.031	0.033	0.032					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-0676-1861		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed cadmium					25.51%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.837	1.86	0.006	8	CDF	0.2135	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.16	2.29	0.1063	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000196		0.0000196	1	0.7	0.4271	Non-Significant Effect				
Error	0.000224		0.000028	8							
Total	0.0002436			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.92	23.2	0.3246	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.885	0.741	0.1493	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.023	0.02	0.03	0.00169	15.50%	0.00%
31243-102		5	0.0272	0.0192	0.0352	0.025	0.022	0.038	0.00289	23.74%	-11.48%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.023	0.023	0.026	0.02					
31243-102		0.025	0.022	0.038	0.028	0.023					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-6268-0444		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed cadmium				17.41%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0.438	1.86	0.004	8	CDF	0.3366	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8028	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0000025	0.0000025	1	0.192	0.6732	Non-Significant Effect					
Error	0.0001044	1.305E-05	8								
Total	0.0001069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.21	23.2	0.8568	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.922	0.741	0.3707	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.023	0.02	0.03	0.00169	15.50%	0.00%
31243-103		5	0.0254	0.0211	0.0297	0.024	0.022	0.03	0.00154	13.52%	-4.10%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.023	0.023	0.026	0.02					
31243-103		0.023	0.024	0.028	0.022	0.03					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-4359-9124		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed cadmium					22.48%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.61	1.86	0.005	8	CDF	0.2793	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8182	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000081		0.0000081	1	0.372	0.5586	Non-Significant Effect				
Error	0.000174		2.175E-05	8							
Total	0.0001821			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.04	23.2	0.5063	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.981	0.741	0.9698	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.023	0.02	0.03	0.00169	15.50%	0.00%
31243-104		5	0.0262	0.0195	0.0329	0.027	0.019	0.033	0.00242	20.62%	-7.38%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.023	0.023	0.026	0.02					
31243-104		0.023	0.029	0.033	0.027	0.019					

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Report Date: 05 Feb-19 15:36 (p 10 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-6343-1957		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed cadmium					17.97%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	1.53	1.86	0.004	8	CDF	0.0827	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.71	2.29	0.6683	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000324		0.0000324	1	2.33	0.1653	Non-Significant Effect				
Error	0.0001112		0.0000139	8							
Total	0.0001436			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.06	23.2	0.9568	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.973	0.741	0.9159	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0244	0.0197	0.0291	0.023	0.02	0.03	0.00169	15.50%	0.00%
31243-105		5	0.028	0.0234	0.0326	0.028	0.022	0.031	0.00164	13.12%	-14.75%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.023	0.023	0.026	0.02					
31243-105		0.022	0.031	0.031	0.028	0.028					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 11 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-2238-2526		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed chromium				28.25%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.19	1.86	0.137	8	CDF	0.5728	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.76	2.29	0.5616	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00049		0.00049	1	0.036	0.8543	Non-Significant Effect				
Error	0.109		0.013625	8							
Total	0.10949			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			6.97	23.2	0.0866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.982	0.741	0.9736	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.44	0.31	0.68	0.069	31.76%	0.00%
31243-101		5	0.472	0.399	0.545	0.45	0.4	0.55	0.0262	12.39%	2.88%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.39	0.44	0.31	0.68	0.61					
31243-101		0.45	0.4	0.55	0.45	0.51					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 12 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-6598-3043		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed chromium				30.45%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.28	1.86	0.148	8	CDF	0.8821	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8229	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.02601		0.02601	1	1.64	0.2358	Non-Significant Effect				
Error	0.12664		0.01583	8							
Total	0.15265			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.04	23.2	0.3065	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.959	0.741	0.7718	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.44	0.31	0.68	0.069	31.76%	0.00%
31243-102		5	0.384	0.274	0.494	0.36	0.27	0.51	0.0396	23.04%	20.99%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.39	0.44	0.31	0.68	0.61					
31243-102		0.36	0.36	0.51	0.42	0.27					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 13 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-8905-2944		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed chromium					30.08%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.28	1.86	0.146	8	CDF	0.6066	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.66	2.29	0.7781	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00121		0.00121	1	0.0783	0.7867	Non-Significant Effect				
Error	0.12364		0.015455	8							
Total	0.12485			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.37	23.2	0.2667	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.936	0.741	0.5047	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.44	0.31	0.68	0.069	31.76%	0.00%
31243-103		5	0.464	0.36	0.568	0.42	0.39	0.59	0.0376	18.13%	4.53%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.39	0.44	0.31	0.68	0.61					
31243-103		0.39	0.41	0.59	0.42	0.51					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-6324-5319		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed chromium					27.43%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-2.29	1.86	0.133	8	CDF	0.9743	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.82	2.29	0.4725	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.06724		0.06724	1	5.23	0.0515	Non-Significant Effect				
Error	0.1028		0.01285	8							
Total	0.17004			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			12.7	23.2	0.0302	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.982	0.741	0.9746	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.44	0.31	0.68	0.069	31.76%	0.00%
31243-104		5	0.322	0.268	0.376	0.31	0.27	0.38	0.0193	13.43%	33.74%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.39	0.44	0.31	0.68	0.61					
31243-104		0.31	0.38	0.3	0.27	0.35					

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Report Date: 05 Feb-19 15:36 (p 15 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-5807-8577		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed chromium					50.12%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.0153	1.86	0.244	8	CDF	0.4941	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.26	2.29	0.0595	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1.000E-05		1.000E-05	1	0.000233	0.9882	Non-Significant Effect				
Error	0.3432		0.0429	8							
Total	0.34321			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.6	23.2	0.3771	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.806	0.741	0.0174	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.486	0.294	0.678	0.44	0.31	0.68	0.069	31.76%	0.00%
31243-105		5	0.488	0.179	0.797	0.36	0.36	0.93	0.111	51.01%	-0.41%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.39	0.44	0.31	0.68	0.61					
31243-105		0.36	0.93	0.43	0.36	0.36					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 16 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-2085-3074		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed copper					6.71%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	1.7	1.86	0.131	8	CDF	0.0641	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.52	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.036	0.036	1	2.88	0.1281	Non-Significant Effect					
Error	0.1	0.0125	8								
Total	0.136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.08	23.2	0.9400	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.741	0.2037	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	2	1.8	2.1	0.051	5.82%	0.00%
31243-101		5	2.08	1.94	2.22	2	2	2.2	0.049	5.27%	-6.12%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2	1.8	2	1.9	2.1					
31243-101		2	2.2	2	2.2	2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 17 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-8795-3351		Endpoint: Copper		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed copper	8.05%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.18	1.86	0.158	8	CDF	0.1362	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.9	2.29	0.3527	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	1.39	0.2725	Non-Significant Effect					
Error	0.144	0.018	8								
Total	0.169		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.77	23.2	0.5941	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.93	0.741	0.4453	Normal Distribution						
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	2	1.8	2.1	0.051	5.82%	0.00%
31243-102		5	2.06	1.87	2.25	2	1.9	2.3	0.0678	7.36%	-5.10%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2	1.8	2	1.9	2.1					
31243-102		2	2.1	2.3	2	1.9					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 18 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-0357-0546		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed copper				12.37%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	1.69	1.86	0.242	8	CDF	0.0650	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.16	2.29	0.1086	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.121	0.121	1	2.85	0.1300	Non-Significant Effect					
Error	0.34	0.0425	8								
Total	0.461		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.54	23.2	0.1260	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.929	0.741	0.4383	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	2	1.8	2.1	0.051	5.82%	0.00%
31243-103		5	2.18	1.85	2.51	2.2	1.9	2.6	0.12	12.31%	-11.22%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2	1.8	2	1.9	2.1					
31243-103		2.2	1.9	2.6	2	2.2					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-5105-5445		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed copper	8.05%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-4.95	1.86	0.158	8	CDF	0.9994	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.06	2.29	0.1833	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.441	0.441	1	24.5	0.0011	Significant Effect					
Error	0.144	0.018	8								
Total	0.585		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.77	23.2	0.5941	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.922	0.741	0.3720	Normal Distribution						
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	2	1.8	2.1	0.051	5.82%	0.00%
31243-104		5	1.54	1.35	1.73	1.5	1.4	1.8	0.0678	9.85%	21.43%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2	1.8	2	1.9	2.1					
31243-104		1.8	1.5	1.5	1.5	1.4					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-4258-3067		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed copper				16.04%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	1.42	1.86	0.314	8	CDF	0.0968	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.98	2.29	0.2513	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.144		0.144	1	2.01	0.1936	Non-Significant Effect				
Error	0.572		0.0715	8							
Total	0.716			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			10	23.2	0.0466	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.948	0.741	0.6475	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.96	1.82	2.1	2	1.8	2.1	0.051	5.82%	0.00%
31243-105		5	2.2	1.75	2.65	2.3	1.8	2.7	0.161	16.39%	-12.24%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2	1.8	2	1.9	2.1					
31243-105		2.3	2.7	2.3	1.9	1.8					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-2639-2316		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed lead			24.46%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.165	1.86	0.112	8	CDF	0.5636	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.89	2.29	0.3692	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	0.0273	0.8728	Non-Significant Effect					
Error	0.0732	0.00915	8								
Total	0.07345		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.56	23.2	0.6774	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.938	0.741	0.5330	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.42	0.37	0.56	0.0378	18.38%	0.00%
31243-101		5	0.45	0.319	0.581	0.43	0.33	0.62	0.0472	23.47%	2.17%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.41	0.42	0.37	0.54	0.56					
31243-101		0.43	0.42	0.62	0.33	0.45					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-6922-1056		Endpoint: Lead			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed lead					19.70%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.31	1.86	0.091	8	CDF	0.8872	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.46	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01024	0.01024	1	1.72	0.2256	Non-Significant Effect					
Error	0.04752	0.00594	8								
Total	0.05776		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.51	23.2	0.6987	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.944	0.741	0.5990	Normal Distribution				
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.42	0.37	0.56	0.0378	18.38%	0.00%
31243-102		5	0.396	0.311	0.481	0.4	0.29	0.47	0.0308	17.37%	13.91%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.41	0.42	0.37	0.54	0.56					
31243-102		0.4	0.38	0.47	0.44	0.29					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-9033-2205		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed lead				17.37%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-1.49	1.86	0.08	8	CDF	0.9127	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.56	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01024	0.01024	1	2.22	0.1747	Non-Significant Effect					
Error	0.03692	0.004615	8								
Total	0.04716		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.44	23.2	0.2589	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.912	0.741	0.2968	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.42	0.37	0.56	0.0378	18.38%	0.00%
31243-103		5	0.396	0.339	0.453	0.37	0.35	0.45	0.0204	11.52%	13.91%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.41	0.42	0.37	0.54	0.56					
31243-103		0.35	0.37	0.45	0.37	0.44					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-1939-2709	Endpoint: Lead		CETIS Version: CETISv1.9.3		Official Results: Yes						
Analyzed: 05 Feb-19 15:34	Analysis: Parametric-Two Sample										
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed lead			18.39%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-3.3	1.86	0.085	8	CDF	0.9945	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.47	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.05625	0.05625	1	10.9	0.0109	Significant Effect					
Error	0.0414	0.005175	8								
Total	0.09765		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.23	23.2	0.4553	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.889	0.741	0.1648	Normal Distribution					
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.42	0.37	0.56	0.0378	18.38%	0.00%
31243-104		5	0.31	0.24	0.38	0.28	0.25	0.38	0.0253	18.25%	32.61%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.41	0.42	0.37	0.54	0.56					
31243-104		0.28	0.38	0.28	0.25	0.36					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-2190-3102		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 failed lead				24.58%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	2.37	1.86	0.113	8	CDF	0.0227	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.05	2.29	0.1859	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.05184	0.05184	1	5.61	0.0453	Significant Effect					
Error	0.07392	0.00924	8								
Total	0.12576		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.58	23.2	0.6665	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.842	0.741	0.0463	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.355	0.565	0.42	0.37	0.56	0.0378	18.38%	0.00%
31243-105		5	0.604	0.472	0.736	0.57	0.52	0.79	0.0476	17.62%	-31.30%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.41	0.42	0.37	0.54	0.56					
31243-105		0.58	0.79	0.56	0.52	0.57					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-1030-4500		Endpoint: Mercury		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed mercury			21.94%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-4.37	1.86	0.001	8	CDF	0.9988	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.42	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.723E-05	2.723E-05	1	19.1	0.0024	Significant Effect					
Error	0.0000114	1.425E-06	8								
Total	3.863E-05		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.71	23.2	0.6144	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.898	0.741	0.2082	Normal Distribution						
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.007	0.005	0.008	0.0006	20.96%	0.00%
31243-101		5	0.0031	0.00183	0.00437	0.003	0.0015	0.004	0.000458	33.05%	51.56%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.008	0.005	0.005	0.007	0.007					
31243-101		0.004	0.003	0.004	0.0015	0.003					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-6589-9510		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed mercury					19.49%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-6.86	1.86	0.001	8	CDF	0.9999	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.6	2.29	0.9074	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0000529	0.0000529	1	47	1.3E-04	Significant Effect					
Error	0.000009	1.125E-06	8								
Total	0.0000619		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.922	0.741	0.3699	Normal Distribution				
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.007	0.005	0.008	0.0006	20.96%	0.00%
31243-102		5	0.0018	0.000967	0.00263	0.0015	0.0015	0.003	0.0003	37.27%	71.88%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.008	0.005	0.005	0.007	0.007					
31243-102		0.0015	0.0015	0.003	0.0015	0.0015					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-5296-1956		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed mercury					22.97%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-5.19	1.86	0.001	8	CDF	0.9996	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.44	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.203E-05	4.203E-05	1	26.9	8.4E-04	Significant Effect					
Error	0.0000125	1.563E-06	8								
Total	5.453E-05		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.36	23.2	0.7738	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1275	Normal Distribution				
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.007	0.005	0.008	0.0006	20.96%	0.00%
31243-103		5	0.0023	0.000871	0.00373	0.0015	0.0015	0.004	0.000515	50.05%	64.06%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.008	0.005	0.005	0.007	0.007					
31243-103		0.003	0.0015	0.0015	0.0015	0.004					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 29 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-6362-6041		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed mercury					22.69%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-5.63	1.86	0.001	8	CDF	0.9998	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.72	2.29	0.6466	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000484		0.0000484	1	31.7	4.9E-04	Significant Effect				
Error	0.0000122		1.525E-06	8							
Total	0.0000606			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.44	23.2	0.7324	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.741	0.2039	Normal Distribution				
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.007	0.005	0.008	0.0006	20.96%	0.00%
31243-104		5	0.002	0.000612	0.00339	0.0015	0.0015	0.004	0.0005	55.90%	68.75%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.008	0.005	0.005	0.007	0.007					
31243-104		0.0015	0.0015	0.0015	0.004	0.0015					

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Report Date: 05 Feb-19 15:36 (p 30 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-0104-8346		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed mercury					22.88%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	1.27	1.86	0.001	8	CDF	0.1199	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.36	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0000025	0.0000025	1	1.61	0.2398	Non-Significant Effect					
Error	0.0000124	1.55E-06	8								
Total	0.0000149		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.38	23.2	0.7602	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.878	0.741	0.1239	Normal Distribution				
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0064	0.00473	0.00807	0.007	0.005	0.008	0.0006	20.96%	0.00%
31243-105		5	0.0074	0.00598	0.00882	0.007	0.006	0.009	0.00051	15.41%	-15.62%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.008	0.005	0.005	0.007	0.007					
31243-105		0.008	0.009	0.006	0.007	0.007					

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Report Date: 05 Feb-19 15:36 (p 31 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-7750-2713		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed nickel				16.60%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-2.24	1.86	0.07	8	CDF	0.9723	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5158	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01764	0.01764	1	5.02	0.0554	Non-Significant Effect					
Error	0.02812	0.003515	8								
Total	0.04576		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.05	23.2	0.9637	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.981	0.741	0.9706	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.44	0.32	0.48	0.0268	14.29%	0.00%
31243-101		5	0.336	0.263	0.409	0.32	0.28	0.42	0.0262	17.43%	20.00%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.42	0.44	0.32	0.48	0.44					
31243-101		0.29	0.32	0.37	0.28	0.42					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-1132-2508		Endpoint: Nickel			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed nickel					15.17%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.81	1.86	0.064	8	CDF	0.9460	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.96	2.29	0.2789	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00961		0.00961	1	3.27	0.1080	Non-Significant Effect				
Error	0.02348		0.002935	8							
Total	0.03309			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.59	23.2	0.6660	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.967	0.741	0.8644	Normal Distribution				
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.44	0.32	0.48	0.0268	14.29%	0.00%
31243-102		5	0.358	0.299	0.417	0.35	0.32	0.44	0.0213	13.31%	14.76%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.42	0.44	0.32	0.48	0.44					
31243-102		0.33	0.35	0.44	0.35	0.32					

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Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-4991-0214		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed nickel				16.72%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.28	1.86	0.070	8	CDF	0.9739	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.78	2.29	0.5375	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01849	0.01849	1	5.19	0.0523	Non-Significant Effect					
Error	0.02852	0.003565	8								
Total	0.04701		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.02	23.2	0.9853	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.928	0.741	0.4275	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.44	0.32	0.48	0.0268	14.29%	0.00%
31243-103		5	0.334	0.26	0.408	0.35	0.26	0.41	0.0266	17.79%	20.48%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.42	0.44	0.32	0.48	0.44					
31243-103		0.26	0.35	0.41	0.29	0.36					

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Report Date: 05 Feb-19 15:36 (p 34 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-3513-9465		Endpoint: Nickel			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed nickel					12.41%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-3.71	1.86	0.052	8	CDF	0.9970	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.39	2.29	0.0231	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.02704	0.02704	1	13.8	0.0060	Significant Effect					
Error	0.01572	0.001965	8								
Total	0.04276		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			10.9	23.2	0.0399	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.862	0.741	0.0811	Normal Distribution				
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.44	0.32	0.48	0.0268	14.29%	0.00%
31243-104		5	0.316	0.293	0.339	0.31	0.3	0.34	0.00812	5.75%	24.76%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.42	0.44	0.32	0.48	0.44					
31243-104		0.3	0.34	0.33	0.3	0.31					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 35 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-0352-2568		Endpoint: Nickel			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed nickel	16.84%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-1.74	1.86	0.071	8	CDF	0.9396	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.76	2.29	0.5594	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01089	0.01089	1	3.01	0.1208	Non-Significant Effect					
Error	0.02892	0.003615	8								
Total	0.03981		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.01	23.2	0.9938	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.982	0.741	0.9731	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.42	0.346	0.494	0.44	0.32	0.48	0.0268	14.29%	0.00%
31243-105		5	0.354	0.279	0.429	0.34	0.3	0.45	0.0269	17.02%	15.71%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.42	0.44	0.32	0.48	0.44					
31243-105		0.34	0.45	0.37	0.3	0.31					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 36 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-4384-6194		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed zinc	15.98%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.468	1.86	1.51	8	CDF	0.3260	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.84	2.29	0.4401	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.360999	0.360999	1	0.219	0.6520	Non-Significant Effect					
Error	13.16	1.645	8								
Total	13.521		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.52	23.2	0.6970	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.901	0.741	0.2264	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	10.1	8.1	10.5	0.511	12.12%	0.00%
31243-101		5	9.82	8.07	11.6	10.2	7.6	11.2	0.63	14.34%	-4.03%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	10.5	8.3	10.2	10.1	8.1					
31243-101		7.6	11.2	10.2	9.4	10.7					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 37 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-7056-8033		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed zinc				18.61%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.38	1.86	1.76	8	CDF	0.1030	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.03	2.29	0.2046	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.225	4.225	1	1.89	0.2060	Non-Significant Effect					
Error	17.844	2.2305	8								
Total	22.069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.41	23.2	0.4150	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.964	0.741	0.8283	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	10.1	8.1	10.5	0.511	12.12%	0.00%
31243-102		5	10.7	8.54	12.9	10.5	8.7	13.6	0.794	16.53%	-13.77%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	10.5	8.3	10.2	10.1	8.1					
31243-102		10.5	8.7	13.6	10.6	10.3					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 38 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-0169-8430		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed zinc	15.14%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.468	1.86	1.43	8	CDF	0.6740	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.2	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.324001	0.324001	1	0.219	0.6521	Non-Significant Effect					
Error	11.82	1.4775	8								
Total	12.144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.26	23.2	0.8287	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.842	0.741	0.0470	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	10.1	8.1	10.5	0.511	12.12%	0.00%
31243-103		5	9.08	7.49	10.7	8.9	7.7	10.4	0.574	14.13%	3.81%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	10.5	8.3	10.2	10.1	8.1					
31243-103		8	10.4	8.9	7.7	10.4					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 39 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-4472-5498		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed zinc				12.03%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-1.02	1.86	1.14	8	CDF	0.8301	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.47	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.961001	0.961001	1	1.03	0.3397	Non-Significant Effect					
Error	7.46	0.9325	8								
Total	8.421		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.35	23.2	0.4286	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.855	0.741	0.0674	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	10.1	8.1	10.5	0.511	12.12%	0.00%
31243-104		5	8.82	7.89	9.75	9	7.6	9.5	0.334	8.46%	6.57%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	10.5	8.3	10.2	10.1	8.1					
31243-104		8.7	9.5	9.3	9	7.6					

CETIS Analytical Report

Report Date: 05 Feb-19 15:36 (p 40 of 40)
Test Code: 31249Mn-Met | 12-9274-1446

Bioaccumulation Evaluation - Metals - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-0176-2888		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:34		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed zinc				15.06%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.262	1.86	1.42	8	CDF	0.4001	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.63	2.29	0.8298	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0999998	0.0999998	1	0.0685	0.8002	Non-Significant Effect					
Error	11.684	1.4605	8								
Total	11.784		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.23	23.2	0.8439	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1798	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.44	8.02	10.9	10.1	8.1	10.5	0.511	12.12%	0.00%
31243-105		5	9.64	8.06	11.2	9.8	8.4	11.5	0.568	13.17%	-2.12%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	10.5	8.3	10.2	10.1	8.1					
31243-105		8.5	10	11.5	9.8	8.4					

Macoma nasuta
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
PAHs

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
PAHs (ng/g wet weight)						
Acenaphthene	2.5	U	2.3	U	2.3	U
Acenaphthylene	2.5	U	2.3	U	2.3	U
Anthracene	2.5	U	2.3	U	2.3	U
Benzo(a)anthracene	2.5	U	2.3	U	2.3	U
Benzo(a)pyrene	2.5	U	2.3	U	2.3	U
Benzo(b)fluoranthene	2.5	U	2.3	U	2.3	U
Benzo(k)fluoranthene	2.5	U	2.3	U	2.3	U
Benzo(g,h,i)perylene	2.5	U	2.3	U	2.3	U
Chrysene	2.5	U	2.3	U	2.3	U
Dibenzo(a,h)anthracene	2.5	U	2.3	U	2.3	U
Fluoranthene	2.5	U	5.7	J	2.3	U
Fluorene	2.5	U	2.3	U	2.3	U
Indeno(1,2,3-c,d)pyrene	2.5	U	2.3	U	2.3	U
Naphthalene	2.5	U	2.3	U	2.3	U
Phenanthrene	2.5	U	2.3	U	2.3	U
Pyrene	2.5	U	5.0	J	2.3	U
PAH Total	40		44		36	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Acenaphthylene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Anthracene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Benzo(a)anthracene	5.2	J	2.4	U	2.1	U	5.9	J	2.4	U
Benzo(a)pyrene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Benzo(b)fluoranthene	5.0	J	2.4	U	2.1	U	2.2	U	2.4	U
Benzo(k)fluoranthene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Benzo(g,h,i)perylene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Chrysene	2.4	U	2.4	U	2.1	U	4.8	J	2.4	U
Dibenzo(a,h)anthracene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Fluoranthene	8.4	J	7.3	J	2.1	U	8.3	J	5.3	J
Fluorene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Naphthalene	2.4	U	2.4	U	2.1	U	2.2	U	2.4	U
Phenanthrene	5.3	J	5.4	J	2.1	U	5.7	J	2.4	U
Pyrene	11		9.5	J	5.9	J	12		8.1	J
PAH Total	61		53		38		60		48	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Acenaphthylene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Anthracene	4.5	J	2.2	U	4.9	J	4.5	J	2.4	U
Benzo(a)anthracene	19		17		20		17		17	
Benzo(a)pyrene	7.5	J	7.4	J	8.6	J	7.1	J	7.8	J
Benzo(b)fluoranthene	17		16		19		15		15	
Benzo(k)fluoranthene	8.0	J	7.5	J	8.9	J	7.1	J	9.7	
Benzo(g,h,i)perylene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Chrysene	19		16		20		16		17	
Dibenzo(a,h)anthracene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Fluoranthene	61		48		58		53		53	
Fluorene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Naphthalene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Phenanthrene	14		9.6		13		13		12	
Pyrene	50		42		46		44		45	
PAH Total	215		182		214		192		195	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	4.4	J	2.4	U	2.2	U	2.2	U	2.2	U
Acenaphthylene	2.1	U	2.4	U	2.2	U	2.2	U	2.2	U
Anthracene	7.0	J	6.0	J	9.0		8.2	J	7.0	J
Benzo(a)anthracene	23		21		29		28		20	
Benzo(a)pyrene	8.0	J	7.8	J	11		10		7.1	J
Benzo(b)fluoranthene	16		16		20		19		14	
Benzo(k)fluoranthene	11		8.9	J	15		13		9.8	
Benzo(g,h,i)perylene	4.3	J	2.4	U	5.8	J	4.5	J	2.2	U
Chrysene	23		19		29		25		20	
Dibenzo(a,h)anthracene	2.1	U	2.4	U	2.2	U	2.2	U	2.2	U
Fluoranthene	96		89		113		102		90	
Fluorene	2.1	U	2.4	U	2.2	U	2.2	U	2.2	U
Indeno(1,2,3-c,d)pyrene	2.1	U	2.4	U	4.5	J	2.2	U	2.2	U
Naphthalene	2.1	U	2.4	U	2.2	U	2.2	U	2.2	U
Phenanthrene	17		14		18		17		16	
Pyrene	71		70		82		77		63	
PAH Total	290		269		347		317		262	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.1	U	2.3	U	2.3	U	2.2	U
Acenaphthylene	2.4	U	2.1	U	2.3	U	2.3	U	2.2	U
Anthracene	6.5	J	6.8	J	6.8	J	5.8	J	7.3	J
Benzo(a)anthracene	21		24		21		22		25	
Benzo(a)pyrene	8.4	J	10		8.6	J	10		11	
Benzo(b)fluoranthene	16		20		16		16		17	
Benzo(k)fluoranthene	9.2	J	9.6		9.5		12		14	
Benzo(g,h,i)perylene	2.4	U	5.3	J	2.3	U	5.5	J	5.5	J
Chrysene	20		26		23		23		26	
Dibenzo(a,h)anthracene	2.4	U	2.1	U	2.3	U	2.3	U	2.2	U
Fluoranthene	76		90		82		75		93	
Fluorene	2.4	U	2.1	U	2.3	U	2.3	U	2.2	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.1	U	2.3	U	2.3	U	4.7	J
Naphthalene	2.4	U	2.1	U	2.3	U	2.3	U	2.2	U
Phenanthrene	21		25		23		18		23	
Pyrene	55		71		64		59		73	
PAH Total	250		299		271		260		311	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Acenaphthylene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Anthracene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Benzo(a)anthracene	6.6	J	9.3		7.7	J	6.1	J	7.6	J
Benzo(a)pyrene	2.4	U	4.5	J	2.2	U	2.4	U	2.2	U
Benzo(b)fluoranthene	7.1	J	9.0		9.1		6.7	J	7.2	J
Benzo(k)fluoranthene	2.4	U	6.3	J	4.7	J	2.4	U	6.3	J
Benzo(g,h,i)perylene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Chrysene	6.8	J	8.9	J	7.9	J	6.4	J	8.1	J
Dibenzo(a,h)anthracene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Fluoranthene	27		32		30		24		30	
Fluorene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Naphthalene	2.4	U	2.2	U	2.2	U	2.4	U	2.2	U
Phenanthrene	7.8	J	7.3	J	6.6	J	6.1	J	6.8	J
Pyrene	22		27		25		18		25	
PAH Total	102		122		110		91		110	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.4	U	2.2	U	2.4	U	2.3	U
Acenaphthylene	2.4	U	2.4	U	2.2	U	2.4	U	2.3	U
Anthracene	2.4	U	6.2	J	6.1	J	5.1	J	2.3	U
Benzo(a)anthracene	24		38		32		26		17	
Benzo(a)pyrene	14		25		18		19		11	
Benzo(b)fluoranthene	21		30		25		22		16	
Benzo(k)fluoranthene	16		24		18		17		12	
Benzo(g,h,i)perylene	6.0	J	11		7.9	J	7.9	J	5.6	J
Chrysene	25		43		35		27		19	
Dibenzo(a,h)anthracene	2.4	U	2.4	U	2.2	U	2.4	U	2.3	U
Fluoranthene	68		111		95		67		48	
Fluorene	2.4	U	2.4	U	2.2	U	2.4	U	2.3	U
Indeno(1,2,3-c,d)pyrene	5.3	J	8.4	J	2.2	U	6.8	J	2.3	U
Naphthalene	2.4	U	2.4	U	2.2	U	2.4	U	2.3	U
Phenanthrene	8.8	J	15		13		9.6	J	6.7	J
Pyrene	102		156		127		99		81	
PAH Total	304		480		391		319		232	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:03 (p 1 of 2)

Test Code/ID: 00-7863-7571/31249Mn-PAH

Bioaccumulation Evaluation - PAHs - Macoma																			EnviroSystems, Inc.	
Start Date: 21 Nov-18 12:02			Species: Macoma nasuta			Sample Code: 31249-000														
End Date: 19 Dec-18 12:02			Protocol: US ACE NED RIM (2004)			Sample Source: New Haven Harbor 2018														
Sample Date: 21 Nov-18			Material: Laboratory Control Sediment			Sample Station: Laboratory Control (Mn)														
Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenze	Total PAHs
31242-008	1	6	2.4	2.4	2.4	5.2	2.4	5	2.4	2.4	2.4	2.4	8.4	2.4	2.4	2.4	5.3	11		
31242-008	2	9	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	7.3	2.4	2.4	2.4	5.4	9.5		
31242-008	3	16	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	5.9		
31242-008	4	23	2.2	2.2	2.2	5.9	2.2	2.2	2.2	2.2	4.8	2.2	8.3	2.2	2.2	2.2	5.7	12		
31242-008	5	29	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	5.3	2.4	2.4	2.4	2.4	8.1		
31243-101	1	5	2.2	2.2	4.5	19	7.5	17	2.2	8	19	2.2	61	2.2	2.2	2.2	14	50		
31243-101	2	7	2.2	2.2	2.2	17	7.4	16	2.2	7.5	16	2.2	48	2.2	2.2	2.2	9.6	42		
31243-101	3	13	2.5	2.5	4.9	20	8.6	19	2.5	8.9	20	2.5	58	2.5	2.5	2.5	13	46		
31243-101	4	24	2.2	2.2	4.5	17	7.1	15	2.2	7.1	16	2.2	53	2.2	2.2	2.2	13	44		
31243-101	5	30	2.4	2.4	2.4	17	7.8	15	2.4	9.7	17	2.4	53	2.4	2.4	2.4	12	45		
31243-102	1	2	4.4	2.1	7	23	8	16	4.3	11	23	2.1	96	2.1	2.1	2.1	17	71		
31243-102	2	11	2.4	2.4	6	21	7.8	16	2.4	8.9	19	2.4	89	2.4	2.4	2.4	14	70		
31243-102	3	17	2.2	2.2	9	29	11	20	5.8	15	29	2.2	113	2.2	4.5	2.2	18	82		
31243-102	4	22	2.2	2.2	8.2	28	10	19	4.5	13	25	2.2	102	2.2	2.2	2.2	17	77		
31243-102	5	27	2.2	2.2	7	20	7.1	14	2.2	9.8	20	2.2	90	2.2	2.2	2.2	16	63		
31243-103	1	4	2.4	2.4	6.5	21	8.4	16	2.4	9.2	20	2.4	76	2.4	2.4	2.4	21	55		
31243-103	2	10	2.1	2.1	6.8	24	10	20	5.3	9.6	26	2.1	90	2.1	2.1	2.1	25	71		
31243-103	3	14	2.3	2.3	6.8	21	8.6	16	2.3	9.5	23	2.3	82	2.3	2.3	2.3	23	64		
31243-103	4	21	2.3	2.3	5.8	22	10	16	5.5	12	23	2.3	75	2.3	2.3	2.3	18	59		
31243-103	5	28	2.2	2.2	7.3	25	11	17	5.5	14	26	2.2	93	2.2	4.7	2.2	23	73		
31243-104	1	3	2.4	2.4	2.4	6.6	2.4	7.1	2.4	2.4	6.8	2.4	27	2.4	2.4	2.4	7.8	22		
31243-104	2	8	2.2	2.2	2.2	9.3	4.5	9	2.2	6.3	8.9	2.2	32	2.2	2.2	2.2	7.3	27		
31243-104	3	18	2.2	2.2	2.2	7.7	2.2	9.1	2.2	4.7	7.9	2.2	30	2.2	2.2	2.2	6.6	25		
31243-104	4	19	2.4	2.4	2.4	6.1	2.4	6.7	2.4	2.4	6.4	2.4	24	2.4	2.4	2.4	6.1	18		
31243-104	5	26	2.2	2.2	2.2	7.6	2.2	7.2	2.2	6.3	8.1	2.2	30	2.2	2.2	2.2	6.8	25		
31243-105	1	1	2.4	2.4	2.4	24	14	21	6	16	25	2.4	68	2.4	5.3	2.4	8.8	102		
31243-105	2	12	2.4	2.4	6.2	38	25	30	11	24	43	2.4	111	2.4	8.4	2.4	15	156		

CETIS Test Data Worksheet

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Test Code/ID: 00-7863-7571/31249Mn-PAH

Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenzene	Total PAHs
31243-105	3	15	2.2	2.2	6.1	32	18	25	7.9	18	35	2.2	95	2.2	2.2	2.2	13	127		
31243-105	4	20	2.4	2.4	5.1	26	19	22	7.9	17	27	2.4	67	2.4	6.8	2.4	9.6	99		
31243-105	5	25	2.3	2.3	2.3	17	11	16	5.6	12	19	2.3	48	2.3	2.3	2.3	6.7	81		

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 1 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma **EnviroSystems, Inc.**

Batch ID: 17-2745-8862	Test Type: Bioaccumulation - PAHs	Analyst: Nancy Roka
Start Date: 21 Nov-18 12:02	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 19 Dec-18 12:02	Species: Macoma nasuta	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
13-3474-0254	Acenaphthene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed acenaphthene
08-2109-9841	Acenaphthene	Equal Variance t Two-Sample Test	0.7146	31243-102 passed acenaphthene
17-2674-6774	Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-102 passed acenaphthene
05-7754-4263	Acenaphthene	Equal Variance t Two-Sample Test	0.6822	31243-103 passed acenaphthene
12-1401-2826	Acenaphthene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed acenaphthene
03-2265-8633	Acenaphthene	Equal Variance t Two-Sample Test	0.3038	31243-105 passed acenaphthene
21-4446-2897	Acenaphthylene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed acenaphthylene
06-1618-2847	Acenaphthylene	Equal Variance t Two-Sample Test	0.8267	31243-102 passed acenaphthylene
06-7040-3520	Acenaphthylene	Equal Variance t Two-Sample Test	0.6822	31243-103 passed acenaphthylene
15-9162-7409	Acenaphthylene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed acenaphthylene
08-2056-1266	Acenaphthylene	Equal Variance t Two-Sample Test	0.3038	31243-105 passed acenaphthylene
20-0054-6748	Anthracene	Unequal Variance t Two-Sample Test	0.0367	31243-101 failed anthracene
21-3614-6359	Anthracene	Unequal Variance t Two-Sample Test	3.1E-04	31243-102 failed anthracene
09-6317-6537	Anthracene	Equal Variance t Two-Sample Test	<1.0E-37	31243-103 failed anthracene
11-5271-0134	Anthracene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed anthracene
01-1420-2848	Anthracene	Unequal Variance t Two-Sample Test	0.0356	31243-105 failed anthracene
14-5427-9659	Benzo(a)anthracene	Equal Variance t Two-Sample Test	3.2E-07	31243-101 failed benzo(a)anthracene
06-0050-8200	Benzo(a)anthracene	Equal Variance t Two-Sample Test	3.4E-06	31243-102 failed benzo(a)anthracene
06-5528-0338	Benzo(a)anthracene	Equal Variance t Two-Sample Test	<1.0E-37	31243-103 failed benzo(a)anthracene
16-4843-7693	Benzo(a)anthracene	Equal Variance t Two-Sample Test	0.0021	31243-104 failed benzo(a)anthracene
19-0780-3343	Benzo(a)anthracene	Equal Variance t Two-Sample Test	9.4E-05	31243-105 failed benzo(a)anthracene
04-8615-2596	Benzo(a)pyrene	Equal Variance t Two-Sample Test	<1.0E-37	31243-101 failed benzo(a)pyrene
08-8965-1364	Benzo(a)pyrene	Equal Variance t Two-Sample Test	<1.0E-37	31243-101 failed benzo(a)pyrene
16-8936-6240	Benzo(a)pyrene	Unequal Variance t Two-Sample Test	4.6E-04	31243-102 failed benzo(a)pyrene
14-7533-7838	Benzo(a)pyrene	Unequal Variance t Two-Sample Test	5.9E-05	31243-103 failed benzo(a)pyrene
09-2300-5068	Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.5952	31243-104 passed benzo(a)pyrene
14-1130-0618	Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.3611	31243-104 passed benzo(a)pyrene
11-7985-4163	Benzo(a)pyrene	Unequal Variance t Two-Sample Test	0.0016	31243-105 failed benzo(a)pyrene
07-6489-4164	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	2.3E-07	31243-101 failed benzo(b)fluoranthene
14-4061-3883	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	1.4E-06	31243-102 failed benzo(b)fluoranthene
18-4980-6077	Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-103 failed benzo(b)fluoranthene
14-4861-1123	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	7.8E-05	31243-104 failed benzo(b)fluoranthene
17-1720-4897	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	1.5E-05	31243-105 failed benzo(b)fluoranthene

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 2 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
12-9317-9093	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed benzo(g,h,i)perylene
17-9788-9194	Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	0.0436	31243-102 failed benzo(g,h,i)perylene
14-9722-6069	Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	0.0333	31243-103 failed benzo(g,h,i)perylene
09-3958-2128	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed benzo(g,h,i)perylene
11-1507-2317	Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	0.0026	31243-105 failed benzo(g,h,i)perylene
14-7540-6812	Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	0.0025	31243-105 failed benzo(g,h,i)perylene
06-1872-5668	Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	1.2E-04	31243-101 failed benzo(k)fluoranthene
15-8422-8458	Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	5.6E-04	31243-102 failed benzo(k)fluoranthene
10-5991-9650	Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	3.9E-04	31243-103 failed benzo(k)fluoranthene
20-3657-1078	Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	0.0365	31243-104 failed benzo(k)fluoranthene
19-1009-2096	Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-105 failed benzo(k)fluoranthene
12-3480-7525	Chrysene	Equal Variance t Two-Sample Test	1.5E-07	31243-101 failed chrysene
08-2627-2171	Chrysene	Equal Variance t Two-Sample Test	2.2E-06	31243-102 failed chrysene
08-3604-7899	Chrysene	Equal Variance t Two-Sample Test	<1.0E-37	31243-103 failed chrysene
11-1862-7354	Chrysene	Equal Variance t Two-Sample Test	5.0E-05	31243-104 failed chrysene
16-6515-4273	Chrysene	Unequal Variance t Two-Sample Test	0.0015	31243-105 failed chrysene
09-3212-1340	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed dibenz(a,h)anthracene
12-0345-4823	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.8267	31243-102 passed dibenz(a,h)anthracene
06-7104-7666	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.6822	31243-103 passed dibenz(a,h)anthracene
06-0301-0803	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed dibenz(a,h)anthracene
20-9385-5757	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.3038	31243-105 passed dibenz(a,h)anthracene
03-5038-5377	Fluoranthene	Equal Variance t Two-Sample Test	<1.0E-37	31243-101 failed fluoranthene
18-4480-0285	Fluoranthene	Equal Variance t Two-Sample Test	<1.0E-37	31243-102 failed fluoranthene
18-6902-0736	Fluoranthene	Equal Variance t Two-Sample Test	<1.0E-37	31243-103 failed fluoranthene
05-8319-3164	Fluoranthene	Equal Variance t Two-Sample Test	9.6E-07	31243-104 failed fluoranthene
17-7922-2524	Fluoranthene	Unequal Variance t Two-Sample Test	0.0016	31243-105 failed fluoranthene
06-7099-1216	Fluorene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed fluorene
20-2090-0971	Fluorene	Equal Variance t Two-Sample Test	0.8267	31243-102 passed fluorene
20-7696-8294	Fluorene	Equal Variance t Two-Sample Test	0.6822	31243-103 passed fluorene
16-7066-5749	Fluorene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed fluorene
03-7059-9297	Fluorene	Equal Variance t Two-Sample Test	0.3038	31243-105 passed fluorene
17-4319-2402	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed indeno(1,2,3-cd)pyrene
03-0452-1480	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.7826	31243-102 passed indeno(1,2,3-cd)pyrene
18-8934-3513	Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.6190	31243-102 passed indeno(1,2,3-cd)pyrene
14-7665-3709	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.6048	31243-103 passed indeno(1,2,3-cd)pyrene
05-4800-8548	Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-103 passed indeno(1,2,3-cd)pyrene
16-3695-5345	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed indeno(1,2,3-cd)pyrene
14-1034-4719	Indeno(1,2,3-cd)pyrene	Unequal Variance t Two-Sample Test	0.0463	31243-105 failed indeno(1,2,3-cd)pyrene
01-9452-0586	Naphthalene	Equal Variance t Two-Sample Test	0.5000	31243-101 passed naphthalene
16-0779-7137	Naphthalene	Equal Variance t Two-Sample Test	0.8267	31243-102 passed naphthalene
21-2797-1984	Naphthalene	Equal Variance t Two-Sample Test	0.6822	31243-103 passed naphthalene
03-0879-8652	Naphthalene	Equal Variance t Two-Sample Test	0.5956	31243-104 passed naphthalene
21-0306-2091	Naphthalene	Equal Variance t Two-Sample Test	0.3038	31243-105 passed naphthalene
00-6451-6280	Phenanthrene	Equal Variance t Two-Sample Test	3.6E-05	31243-101 failed phenanthrene
20-7517-1226	Phenanthrene	Equal Variance t Two-Sample Test	1.3E-06	31243-102 failed phenanthrene
15-3299-6093	Phenanthrene	Equal Variance t Two-Sample Test	7.8E-07	31243-103 failed phenanthrene
03-7683-9029	Phenanthrene	Equal Variance t Two-Sample Test	0.0059	31243-104 failed phenanthrene
12-6278-9935	Phenanthrene	Equal Variance t Two-Sample Test	0.0026	31243-105 failed phenanthrene
21-2343-7091	Pyrene	Equal Variance t Two-Sample Test	<1.0E-37	31243-101 failed pyrene
19-9755-8167	Pyrene	Equal Variance t Two-Sample Test	<1.0E-37	31243-102 failed pyrene
12-7641-4731	Pyrene	Equal Variance t Two-Sample Test	1.6E-07	31243-103 failed pyrene
15-3225-3392	Pyrene	Equal Variance t Two-Sample Test	3.8E-05	31243-104 failed pyrene
20-1010-3075	Pyrene	Unequal Variance t Two-Sample Test	6.8E-04	31243-105 failed pyrene

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 3 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma											EnviroSystems, Inc.
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.68	1.48	3.88	2.2	4.4	0.432	0.965	36.02%	-16.52%
31243-103		5	2.26	2.12	2.4	2.1	2.4	0.051	0.114	5.05%	1.74%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	-1.74%
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.1	2.4	0.049	0.11	4.93%	3.48%
31243-103		5	2.26	2.12	2.4	2.1	2.4	0.051	0.114	5.05%	1.74%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	-1.74%
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	3.7	2.1	5.3	2.2	4.9	0.577	1.29	34.87%	-60.87%
31243-102		5	7.44	5.99	8.89	6	9	0.523	1.17	15.72%	-223.48%
31243-103		5	6.64	5.96	7.32	5.8	7.3	0.246	0.55	8.29%	-188.70%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	4.42	2.01	6.83	2.3	6.2	0.867	1.94	43.85%	-92.17%
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	3.6	1.36	5.84	2.1	5.9	0.806	1.8	50.04%	0.00%
31243-101		5	18	16.2	19.8	17	20	0.632	1.41	7.86%	-400.00%
31243-102		5	24.2	19.1	29.3	20	29	1.83	4.09	16.89%	-572.22%
31243-103		5	22.6	20.3	24.9	21	25	0.812	1.82	8.04%	-527.78%
31243-104		5	7.46	5.93	8.99	6.1	9.3	0.55	1.23	16.49%	-107.22%
31243-105		5	27.4	17.5	37.3	17	38	3.57	7.99	29.15%	-661.11%
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	7.68	6.97	8.39	7.1	8.6	0.256	0.572	7.45%	-233.91%
31243-102		5	8.78	6.74	10.8	7.1	11	0.735	1.64	18.72%	-281.74%
31243-103		5	9.6	8.25	10.9	8.4	11	0.486	1.09	11.32%	-317.39%
31243-104		5	2.74	1.51	3.97	2.2	4.5	0.442	0.989	36.09%	-19.13%
31243-105		5	17.4	10.8	24	11	25	2.38	5.32	30.57%	-656.52%
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.1	5	0.548	1.23	43.46%	0.00%
31243-101		5	16.4	14.3	18.5	15	19	0.748	1.67	10.20%	-481.56%
31243-102		5	17	14	20	14	20	1.1	2.45	14.41%	-502.84%
31243-103		5	17	14.8	19.2	16	20	0.775	1.73	10.19%	-502.84%
31243-104		5	7.82	6.41	9.23	6.7	9.1	0.509	1.14	14.56%	-177.30%
31243-105		5	22.8	16.4	29.2	16	30	2.31	5.17	22.66%	-708.51%

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 4 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma											EnviroSystems, Inc.
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	3.84	1.95	5.73	2.2	5.8	0.68	1.52	39.61%	-66.96%
31243-103		5	4.2	2.1	6.3	2.3	5.5	0.756	1.69	40.27%	-82.61%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	7.68	5.03	10.3	5.6	11	0.956	2.14	27.83%	-233.91%
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	8.24	6.93	9.55	7.1	9.7	0.473	1.06	12.83%	-258.26%
31243-102		5	11.5	8.47	14.6	8.9	15	1.1	2.47	21.40%	-401.74%
31243-103		5	10.9	8.27	13.4	9.2	14	0.931	2.08	19.18%	-372.17%
31243-104		5	4.42	1.99	6.85	2.4	6.3	0.875	1.96	44.26%	-92.17%
31243-105		5	17.4	12	22.8	12	24	1.94	4.34	24.92%	-656.52%
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.1	4.8	0.498	1.11	39.52%	0.00%
31243-101		5	17.6	15.3	19.9	16	20	0.812	1.82	10.32%	-524.11%
31243-102		5	23.2	18.2	28.2	19	29	1.8	4.02	17.35%	-722.70%
31243-103		5	23.6	20.5	26.7	20	26	1.12	2.51	10.64%	-736.88%
31243-104		5	7.62	6.36	8.88	6.4	8.9	0.453	1.01	13.30%	-170.21%
31243-105		5	29.8	18.2	41.4	19	43	4.18	9.34	31.34%	-956.74%
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.1	2.4	0.049	0.11	4.93%	3.48%
31243-103		5	2.26	2.12	2.4	2.1	2.4	0.051	0.114	5.05%	1.74%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	-1.74%
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	6.28	2.99	9.57	2.1	8.4	1.18	2.65	42.17%	0.00%
31243-101		5	54.6	48.4	60.8	48	61	2.25	5.03	9.21%	-769.43%
31243-102		5	98	85.7	110	89	113	4.42	9.87	10.08%	-1460.51
31243-103		5	83.2	73.1	93.3	75	93	3.62	8.11	9.74%	-1224.84
31243-104		5	28.6	24.7	32.5	24	32	1.4	3.13	10.95%	-355.41%
31243-105		5	77.8	46.8	109	48	111	11.2	25	32.13%	-1138.85
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.1	2.4	0.049	0.11	4.93%	3.48%
31243-103		5	2.26	2.12	2.4	2.1	2.4	0.051	0.114	5.05%	1.74%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	-1.74%

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 5 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma											EnviroSystems, Inc.
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.68	1.41	3.95	2.1	4.5	0.458	1.02	38.18%	-16.52%
31243-103		5	2.76	1.41	4.11	2.1	4.7	0.487	1.09	39.49%	-20.00%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	5	1.6	8.4	2.2	8.4	1.23	2.74	54.79%	-117.39%
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.1	2.4	0.0632	0.141	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.1	2.4	0.049	0.11	4.93%	3.48%
31243-103		5	2.26	2.12	2.4	2.1	2.4	0.051	0.114	5.05%	1.74%
31243-104		5	2.28	2.14	2.42	2.2	2.4	0.049	0.11	4.80%	0.87%
31243-105		5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	-1.74%
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	2.1	5.7	0.792	1.77	42.37%	0.00%
31243-101		5	12.3	10.2	14.4	9.6	14	0.75	1.68	13.61%	-194.74%
31243-102		5	16.4	14.5	18.3	14	18	0.678	1.52	9.25%	-292.34%
31243-103		5	22	18.7	25.3	18	25	1.18	2.65	12.03%	-426.32%
31243-104		5	6.92	6.11	7.73	6.1	7.8	0.292	0.653	9.44%	-65.55%
31243-105		5	10.6	6.48	14.8	6.7	15	1.49	3.34	31.43%	-154.07%
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	5.9	12	1.08	2.41	25.91%	0.00%
31243-101		5	45.4	41.7	49.1	42	50	1.33	2.97	6.53%	-388.17%
31243-102		5	72.6	63.6	81.6	63	82	3.23	7.23	9.96%	-680.65%
31243-103		5	64.4	54.9	73.9	55	73	3.43	7.67	11.91%	-592.47%
31243-104		5	23.4	19	27.8	18	27	1.57	3.51	14.99%	-151.61%
31243-105		5	113	76.9	149	81	156	13	29.1	25.75%	-1115.05

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 6 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.
Acenaphthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		4.4	2.4	2.2	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	2.2	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	2.4	2.2	2.4	2.3	
Acenaphthylene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.1	2.4	2.2	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	2.2	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	2.4	2.2	2.4	2.3	
Anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		4.5	2.2	4.9	4.5	2.4	
31243-102		7	6	9	8.2	7	
31243-103		6.5	6.8	6.8	5.8	7.3	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	6.2	6.1	5.1	2.3	
Benzo(a)anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	5.2	2.4	2.1	5.9	2.4	
31243-101		19	17	20	17	17	
31243-102		23	21	29	28	20	
31243-103		21	24	21	22	25	
31243-104		6.6	9.3	7.7	6.1	7.6	
31243-105		24	38	32	26	17	
Benzo(a)pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		7.5	7.4	8.6	7.1	7.8	
31243-102		8	7.8	11	10	7.1	
31243-103		8.4	10	8.6	10	11	
31243-104		2.4	4.5	2.2	2.4	2.2	
31243-105		14	25	18	19	11	
Benzo(b)fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	5	2.4	2.1	2.2	2.4	
31243-101		17	16	19	15	15	
31243-102		16	16	20	19	14	
31243-103		16	20	16	16	17	
31243-104		7.1	9	9.1	6.7	7.2	
31243-105		21	30	25	22	16	

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 7 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.
Benzo(g,h,i)perylene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		4.3	2.4	5.8	4.5	2.2	
31243-103		2.4	5.3	2.3	5.5	5.5	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		6	11	7.9	7.9	5.6	
Benzo(k)fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		8	7.5	8.9	7.1	9.7	
31243-102		11	8.9	15	13	9.8	
31243-103		9.2	9.6	9.5	12	14	
31243-104		2.4	6.3	4.7	2.4	6.3	
31243-105		16	24	18	17	12	
Chrysene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	4.8	2.4	
31243-101		19	16	20	16	17	
31243-102		23	19	29	25	20	
31243-103		20	26	23	23	26	
31243-104		6.8	8.9	7.9	6.4	8.1	
31243-105		25	43	35	27	19	
Dibenz(a,h)anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.1	2.4	2.2	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	2.2	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	2.4	2.2	2.4	2.3	
Fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	8.4	7.3	2.1	8.3	5.3	
31243-101		61	48	58	53	53	
31243-102		96	89	113	102	90	
31243-103		76	90	82	75	93	
31243-104		27	32	30	24	30	
31243-105		68	111	95	67	48	
Fluorene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.1	2.4	2.2	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	2.2	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	2.4	2.2	2.4	2.3	

CETIS Summary Report

Report Date: 05 Feb-19 15:41 (p 8 of 8)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.
Indeno(1,2,3-cd)pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.1	2.4	4.5	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	4.7	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		5.3	8.4	2.2	6.8	2.3	
Naphthalene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.4	2.4	2.1	2.2	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.1	2.4	2.2	2.2	2.2	
31243-103		2.4	2.1	2.3	2.3	2.2	
31243-104		2.4	2.2	2.2	2.4	2.2	
31243-105		2.4	2.4	2.2	2.4	2.3	
Phenanthrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	5.3	5.4	2.1	5.7	2.4	
31243-101		14	9.6	13	13	12	
31243-102		17	14	18	17	16	
31243-103		21	25	23	18	23	
31243-104		7.8	7.3	6.6	6.1	6.8	
31243-105		8.8	15	13	9.6	6.7	
Pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	11	9.5	5.9	12	8.1	
31243-101		50	42	46	44	45	
31243-102		71	70	82	77	63	
31243-103		55	71	64	59	73	
31243-104		22	27	25	18	25	
31243-105		102	156	127	99	81	

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Anthracene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	2.411643	2.13185	0.036712	0.05	TRUE	1.237573	4		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	14.05966	1.85955	3.179E-07	0.05	TRUE	1.904562	8		C
Benzo(a)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	20.42219	1.85955	0	0.05	TRUE	0.4898773	8		C
Benzo(a)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	35.35842	1.89458	0	0.05	TRUE	0.2759479	7		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	14.64029	1.85955	2.325E-07	0.05	TRUE	1.724875	8		C
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	12.45089	2.13185	0.0001196	0.05	TRUE	1.017049	4		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	15.50729	1.85955	1.488E-07	0.05	TRUE	1.772336	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	19.00772	1.85955	0	0.05	TRUE	4.727204	8		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0	1.85955	0.5	0.05	FALSE	0.1663231	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	7.462553	1.85955	3.589E-05	0.05	TRUE	2.028357	8		C
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	21.12231	1.85955	0	0.05	TRUE	3.178141	8		C
Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	27		0.5	0.05	FALSE		8	2	E
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.594588	1.89458	0.7145854	0.05	FALSE	0.1593186	7		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999997	1.85955	0.8267032	0.05	FALSE	0.1487639	8		C
Anthracene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	9.755587	2.13185	0.0003092	0.05	TRUE	1.123222	4		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	10.31419	1.85955	3.367E-06	0.05	TRUE	3.713979	8		C
Benzo(a)pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	8.782455	2.13185	0.0004635	0.05	TRUE	1.57295	4		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	11.57638	1.85955	1.409E-06	0.05	TRUE	2.277776	8		C
Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	2.25449	2.13185	0.0436053	0.05	TRUE	1.456225	4		C
Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	8.353188	2.13185	0.0005615	0.05	TRUE	2.358173	4		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	10.91166	1.85955	2.205E-06	0.05	TRUE	3.473126	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999997	1.85955	0.8267032	0.05	FALSE	0.1487639	8		C
Fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	20.06162	1.85955	0	0.05	TRUE	8.501694	8		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999997	1.85955	0.8267032	0.05	FALSE	0.1487639	8		C
Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	28		0.6190476	0.05	FALSE		8	3	E
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.8284167	1.89458	0.7826166	0.05	FALSE	0.1715241	7		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999997	1.85955	0.8267032	0.05	FALSE	0.1487639	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	11.71862	1.85955	1.284E-06	0.05	TRUE	1.939108	8		C
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	18.56872	1.85955	0	0.05	TRUE	6.339123	8		C
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923664	1.85955	0.6821564	0.05	FALSE	0.1510705	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923664	1.85955	0.6821564	0.05	FALSE	0.1510705	8		C
Anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	17.0755	1.85955	0	0.05	TRUE	0.4726326	8		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	16.60672	1.85955	0	0.05	TRUE	2.127537	8		C
Benzo(a)pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	14.90106	2.13185	5.906E-05	0.05	TRUE	1.044387	4		C
Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	15		0.0039683	0.05	TRUE		8	0	E
Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	2.50347	2.13185	0.0332598	0.05	TRUE	1.617958	4		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	9.168856	2.13185	0.0003928	0.05	TRUE	1.990282	4		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	16.91949	1.85955	0	0.05	TRUE	2.28384	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923664	1.85955	0.6821564	0.05	FALSE	0.1510705	8		C
Fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	20.17071	1.85955	0	0.05	TRUE	7.091293	8		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923664	1.85955	0.6821564	0.05	FALSE	0.1510705	8		C
Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	27		0.5	0.05	FALSE		8	2	E
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.2761396	1.89458	0.6047921	0.05	FALSE	0.1715241	7		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923664	1.85955	0.6821564	0.05	FALSE	0.1510705	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	12.51521	1.85955	7.776E-07	0.05	TRUE	2.647751	8		C
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	15.32864	1.85955	1.629E-07	0.05	TRUE	6.684293	8		C
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	3.956946	1.85955	0.0020975	0.05	TRUE	1.813989	8		C
Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	25		0.3611111	0.05	FALSE		8	2	E
Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	20		0.5952381	0.05	FALSE		7	2	E
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	6.682724	1.85955	7.773E-05	0.05	TRUE	1.39131	8		C
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Benzo(k)fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	2.416906	2.13185	0.0365035	0.05	TRUE	1.869959	4		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	7.125396	1.85955	4.974E-05	0.05	TRUE	1.252679	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	12.17221	1.85955	9.616E-07	0.05	TRUE	3.409825	8		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499997	1.85955	0.5955561	0.05	FALSE	0.1487639	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	3.245389	1.85955	0.0058911	0.05	TRUE	1.56997	8		C
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	7.409772	1.85955	3.774E-05	0.05	TRUE	3.53852	8		C
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345224	1.85955	0.3037556	0.05	FALSE	0.1391559	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345224	1.85955	0.3037556	0.05	FALSE	0.1391559	8		C
Anthracene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	2.4392	2.13185	0.035635	0.05	TRUE	1.852868	4		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	6.499482	1.85955	9.41E-05	0.05	TRUE	6.809349	8		C
Benzo(a)pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	6.344762	2.13185	0.0015804	0.05	TRUE	5.073616	4		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	8.4128	1.85955	1.517E-05	0.05	TRUE	4.416338	8		C
Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	5.61698	2.13185	0.0024688	0.05	TRUE	2.041904	4		C
Benzo(g,h,i)perylene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	7.398944	2.35336	0.0025532	0.05	TRUE	1.447207	3		C
Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	15		0.0039683	0.05	TRUE		8	0	E
Chrysene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	6.415015	2.13185	0.0015173	0.05	TRUE	8.966032	4		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345224	1.85955	0.3037556	0.05	FALSE	0.1391559	8		C
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	6.362868	2.13185	0.0015638	0.05	TRUE	23.96241	4		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345224	1.85955	0.3037556	0.05	FALSE	0.1391559	8		C
Indeno(1,2,3-cd)pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	2.200876	2.13185	0.0462811	0.05	TRUE	2.615316	4		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345224	1.85955	0.3037556	0.05	FALSE	0.1391559	8		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	3.810851	1.85955	0.0025782	0.05	TRUE	3.142471	8		C
Pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	7.942665	2.13185	0.0006803	0.05	TRUE	27.83354	4		C

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 1 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-3474-0254		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed acenaphthene				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.16	0.02	8								
Total	0.16		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 2 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 08-2109-9841		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)								
Data Transform	Alt Hyp		Comparison Result				PMSD					
Untransformed	C < T		31243-102 passed acenaphthene				6.93%					
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-102	-0.595	1.89	0.159	7	CDF	0.7146	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0055556		0.0055556	1	0.354	0.5708	Non-Significant Effect					
Error	0.11		0.0157143	7								
Total	0.115556			8								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			2	46.2	0.5956	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.901	0.701	0.2600	Normal Distribution					
Acenaphthene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%	
31243-102		4	2.25	2.09	2.41	2.2	2.2	2.4	0.05	4.44%	2.17%	
Acenaphthene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	2.4	2.4	2.1	2.2	2.4						
31243-102		Outlier	2.4	2.2	2.2	2.2						

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 3 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-7754-4263		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed acenaphthene					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.151	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0040000	0.0040000	1	0.242	0.6357	Non-Significant Effect					
Error	0.132	0.0165	8								
Total	0.136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.26	2.12	2.4	2.3	2.1	2.4	0.051	5.05%	1.74%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	2.2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 4 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-1401-2826		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed acenaphthene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-2265-8633		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed acenaphthene				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.139	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	-1.74%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	2.4	2.2	2.4	2.3					

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Report Date: 05 Feb-19 15:40 (p 6 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-4446-2897		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed acenaphthylene				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.16		0.02	8							
Total	0.16			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Report Date: 05 Feb-19 15:40 (p 7 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-1618-2847		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed acenaphthylene					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.149	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.016		0.016	1	1	0.3466	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.2	2.1	2.4	0.049	4.93%	3.48%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		2.1	2.4	2.2	2.2	2.2					

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Report Date: 05 Feb-19 15:40 (p 8 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-7040-3520		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed acenaphthylene					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.151	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0040000		0.0040000	1	0.242	0.6357	Non-Significant Effect				
Error	0.132		0.0165	8							
Total	0.136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.26	2.12	2.4	2.3	2.1	2.4	0.051	5.05%	1.74%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-9162-7409		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed acenaphthylene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-2056-1266		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed acenaphthylene				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.139	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	-1.74%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	2.4	2.2	2.4	2.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-0054-6748		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed anthracene				53.81%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.41	2.13	1.24	4	CDF	0.0367	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.73	2.29	0.6164	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4.9		4.9	1	5.82	0.0424	Significant Effect				
Error	6.74		0.8425	8							
Total	11.64			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			83.2	23.2	8.4E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.912	0.741	0.2923	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	3.7	2.1	5.3	4.5	2.2	4.9	0.577	34.87%	-60.87%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		4.5	2.2	4.9	4.5	2.4					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-3614-6359		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed anthracene				48.84%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	9.76	2.13	1.12	4	CDF	3.1E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.99	2.29	0.2483	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	66.049		66.049	1	95.2	1.0E-05	Significant Effect				
Error	5.552		0.694	8							
Total	71.601			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			68.4	23.2	0.0012	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.933	0.741	0.4827	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	7.44	5.99	8.89	7	6	9	0.523	15.72%	-223.48%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		7	6	9	8.2	7					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 13 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-6317-6537		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed anthracene				20.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	17.1	1.86	0.473	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.22	2.29	0.0792	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	47.089		47.089	1	292	1.4E-07	Significant Effect				
Error	1.292		0.1615	8							
Total	48.381			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			15.1	23.2	0.0221	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.741	0.1398	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	6.64	5.96	7.32	6.8	5.8	7.3	0.246	8.29%	-188.70%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		6.5	6.8	6.8	5.8	7.3					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 14 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-5271-0134		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed anthracene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 15 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-1420-2848		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed anthracene				80.56%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	2.44	2.13	1.85	4	CDF	0.0356	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8210	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	11.236		11.236	1	5.95	0.0406	Significant Effect				
Error	15.108		1.8885	8							
Total	26.344			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			188	23.2	1.7E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.89	0.741	0.1717	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	4.42	2.01	6.83	5.1	2.3	6.2	0.867	43.85%	-92.17%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	6.2	6.1	5.1	2.3					

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Report Date: 05 Feb-19 15:40 (p 16 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 14-5427-9659		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-101 failed benzo(a)anthracene						52.90%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-101*	14.1	1.86	1.9	8	CDF	3.2E-07	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.51	2.29	1.0000	No Outliers Detected					
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	518.4		518.4	1	198	6.4E-07	Significant Effect					
Error	20.98		2.6225	8								
Total	539.38			9								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			1.62	23.2	0.6506	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.793	0.741	0.0119	Normal Distribution					
Benzo(a)anthracene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	3.6	1.36	5.84	2.4	2.1	5.9	0.806	50.04%	0.00%	
31243-101		5	18	16.2	19.8	17	17	20	0.632	7.86%	-400.00%	
Benzo(a)anthracene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	5.2	2.4	2.1	5.9	2.4						
31243-101		19	17	20	17	17						

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Report Date: 05 Feb-19 15:40 (p 17 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 06-0050-8200		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-102 failed benzo(a)anthracene						103.17%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-102*	10.3	1.86	3.71	8	CDF	3.4E-06	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.61	2.29	0.8777	No Outliers Detected					
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1060.9		1060.9	1	106	6.7E-06	Significant Effect					
Error	79.78		9.9725	8								
Total	1140.68			9								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			5.15	23.2	0.1416	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.932	0.741	0.4714	Normal Distribution					
Benzo(a)anthracene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	3.6	1.36	5.84	2.4	2.1	5.9	0.806	50.04%	0.00%	
31243-102		5	24.2	19.1	29.3	23	20	29	1.83	16.89%	-572.22%	
Benzo(a)anthracene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	5.2	2.4	2.1	5.9	2.4						
31243-102		23	21	29	28	20						

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Report Date: 05 Feb-19 15:40 (p 18 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 06-5528-0338		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-103 failed benzo(a)anthracene						59.10%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-103*	16.6	1.86	2.13	8	CDF	<1.0E-37	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.41	2.29	1.0000	No Outliers Detected					
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	902.5		902.5	1	276	1.7E-07	Significant Effect					
Error	26.18		3.2725	8								
Total	928.68			9								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			1.02	23.2	0.9874	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.803	0.741	0.0159	Normal Distribution					
Benzo(a)anthracene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	3.6	1.36	5.84	2.4	2.1	5.9	0.806	50.04%	0.00%	
31243-103		5	22.6	20.3	24.9	22	21	25	0.812	8.04%	-527.78%	
Benzo(a)anthracene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	5.2	2.4	2.1	5.9	2.4						
31243-103		21	24	21	22	25						

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Report Date: 05 Feb-19 15:40 (p 19 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 16-4843-7693		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-104 failed benzo(a)anthracene						50.39%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-104*	3.96	1.86	1.81	8	CDF	0.0021	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.58	2.29	0.9533	No Outliers Detected					
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	37.249	37.249	1	15.7	0.0042	Significant Effect						
Error	19.032	2.379	8									
Total	56.281		9									
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			2.14	23.2	0.4781	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.862	0.741	0.0801	Normal Distribution					
Benzo(a)anthracene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	3.6	1.36	5.84	2.4	2.1	5.9	0.806	50.04%	0.00%	
31243-104		5	7.46	5.93	8.99	7.6	6.1	9.3	0.55	16.49%	-107.22%	
Benzo(a)anthracene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	5.2	2.4	2.1	5.9	2.4						
31243-104		6.6	9.3	7.7	6.1	7.6						

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 20 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 19-0780-3343		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-105 failed benzo(a)anthracene						189.15%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-105*	6.5	1.86	6.81	8	CDF	9.4E-05	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.94	2.29	0.2973	No Outliers Detected					
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1416.1		1416.1	1	42.2	1.9E-04	Significant Effect					
Error	268.18		33.5225	8								
Total	1684.28			9								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			19.7	23.2	0.0136	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.938	0.741	0.5339	Normal Distribution					
Benzo(a)anthracene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	3.6	1.36	5.84	2.4	2.1	5.9	0.806	50.04%	0.00%	
31243-105		5	27.4	17.5	37.3	26	17	38	3.57	29.15%	-661.11%	
Benzo(a)anthracene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	5.2	2.4	2.1	5.9	2.4						
31243-105		24	38	32	26	17						

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 21 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-8965-1364		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed benzo(a)pyrene				21.30%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	20.4	1.86	0.49	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.34	2.29	0.0344	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	72.361		72.361	1	417	<1.0E-37	Significant Effect				
Error	1.388		0.1735	8							
Total	73.749			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			16.3	23.2	0.0192	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.87	0.741	0.0999	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	7.68	6.97	8.39	7.5	7.1	8.6	0.256	7.45%	-233.91%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		7.5	7.4	8.6	7.1	7.8					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 22 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-8936-6240		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed benzo(a)pyrene				68.39%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	8.78	2.13	1.57	4	CDF	4.6E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.02	2.29	0.2164	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	104.976		104.976	1	77.1	2.2E-05	Significant Effect				
Error	10.888		1.361	8							
Total	115.864			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			135	23.2	3.2E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.937	0.741	0.5242	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	8.78	6.74	10.8	8	7.1	11	0.735	18.72%	-281.74%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		8	7.8	11	10	7.1					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 23 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-7533-7838		Endpoint:	Benzo(a)pyrene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 failed benzo(a)pyrene					45.41%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	14.9	2.13	1.04	4	CDF	5.9E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.92	2.29	0.3274	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	133.225	133.225	1	222	4.1E-07	Significant Effect					
Error	4.8	0.6	8								
Total	138.025		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	59	23.2	0.0016	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.923	0.741	0.3868	Normal Distribution						
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	9.6	8.25	10.9	10	8.4	11	0.486	11.32%	-317.39%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		8.4	10	8.6	10	11					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 24 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-1130-0618		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(a)pyrene					36.12%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	25	n/a	2	8	Exact	0.3611	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.64	2.29	0.0010	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.484	0.484	1	0.97	0.3535	Non-Significant Effect					
Error	3.992	0.499	8								
Total	4.476		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			48.9	23.2	0.0024	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.709	0.741	0.0011	Non-Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.74	1.51	3.97	2.4	2.2	4.5	0.442	36.09%	-19.13%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	4.5	2.2	2.4	2.2					

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Report Date: 05 Feb-19 15:40 (p 25 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-7985-4163		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 failed benzo(a)pyrene					220.59%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	6.34	2.13	5.07	4	CDF	0.0016	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.14	2.29	0.1199	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	570.025		570.025	1	40.3	2.2E-04	Significant Effect				
Error	113.28		14.16	8							
Total	683.305			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1410	23.2	3.0E-06	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.86	0.741	0.0773	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	17.4	10.8	24	18	11	25	2.38	30.57%	-656.52%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		14	25	18	19	11					

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Report Date: 05 Feb-19 15:40 (p 26 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-6489-4164		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed benzo(b)fluoranthene				61.17%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	14.6	1.86	1.72	8	CDF	2.3E-07	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.88	2.29	0.3756	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	461.041	461.041	1	214	4.7E-07	Significant Effect					
Error	17.208	2.151	8								
Total	478.249		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.86	23.2	0.5612	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.831	0.741	0.0348	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.4	2.1	5	0.548	43.46%	0.00%
31243-101		5	16.4	14.3	18.5	16	15	19	0.748	10.20%	-481.56%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5	2.4	2.1	2.2	2.4					
31243-101		17	16	19	15	15					

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Report Date: 05 Feb-19 15:40 (p 27 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-4061-3883		Endpoint:	Benzo(b)fluoranthene		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed benzo(b)fluoranthene				80.77%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	11.6	1.86	2.28	8	CDF	1.4E-06	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8057	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	502.681	502.681	1	134	2.8E-06	Significant Effect					
Error	30.008	3.751	8								
Total	532.689		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.99	23.2	0.2084	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.893	0.741	0.1828	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.4	2.1	5	0.548	43.46%	0.00%
31243-102		5	17	14	20	16	14	20	1.1	14.41%	-502.84%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5	2.4	2.1	2.2	2.4					
31243-102		16	16	20	19	14					

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Report Date: 05 Feb-19 15:40 (p 28 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-4980-6077		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed benzo(b)fluoranthene				62.57%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	15	n/a	0	8	Exact	0.0040	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.12	2.29	0.1338	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	502.681	502.681	1	223	4.0E-07	Significant Effect					
Error	18.008	2.251	8								
Total	520.689		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2	23.2	0.5193	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.72	0.741	0.0015	Non-Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.4	2.1	5	0.548	43.46%	0.00%
31243-103		5	17	14.8	19.2	16	16	20	0.775	10.19%	-502.84%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5	2.4	2.1	2.2	2.4					
31243-103		16	20	16	16	17					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 29 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-4861-1123		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 failed benzo(b)fluoranthene				49.34%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	6.68	1.86	1.39	8	CDF	7.8E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.95	2.29	0.2826	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	62.5	62.5	1	44.7	1.6E-04	Significant Effect					
Error	11.196	1.3995	8								
Total	73.696		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.16	23.2	0.8903	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.799	0.741	0.0141	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.4	2.1	5	0.548	43.46%	0.00%
31243-104		5	7.82	6.41	9.23	7.2	6.7	9.1	0.509	14.56%	-177.30%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5	2.4	2.1	2.2	2.4					
31243-104		7.1	9	9.1	6.7	7.2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 30 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-1720-4897		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 failed benzo(b)fluoranthene	156.61%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	8.41	1.86	4.42	8	CDF	1.5E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.03	2.29	0.2023	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	998.001	998.001	1	70.8	3.0E-05	Significant Effect					
Error	112.808	14.101	8								
Total	1110.81		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	17.8	23.2	0.0164	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1788	Normal Distribution						
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.3	4.34	2.4	2.1	5	0.548	43.46%	0.00%
31243-105		5	22.8	16.4	29.2	22	16	30	2.31	22.66%	-708.51%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5	2.4	2.1	2.2	2.4					
31243-105		21	30	25	22	16					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	12-9317-9093		Endpoint:	Benzo(g,h,i)perylene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:38		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-101 passed benzo(g,h,i)perylene					7.23%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.16	0.02	8								
Total	0.16		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Report Date: 05 Feb-19 15:40 (p 32 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-9788-9194		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed benzo(g,h,i)perylene				63.31%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	2.25	2.13	1.46	4	CDF	0.0436	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.92	2.29	0.3177	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	5.929		5.929	1	5.08	0.0542	Non-Significant Effect				
Error	9.332		1.1665	8							
Total	15.261			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			116	23.2	4.4E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.915	0.741	0.3177	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	3.84	1.95	5.73	4.3	2.2	5.8	0.68	39.61%	-66.96%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		4.3	2.4	5.8	4.5	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-9722-6069		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 failed benzo(g,h,i)perylene					70.35%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.5	2.13	1.62	4	CDF	0.0333	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7254	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	9.025		9.025	1	6.27	0.0367	Significant Effect				
Error	11.52		1.44	8							
Total	20.545			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			143	23.2	2.9E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.866	0.741	0.0903	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	4.2	2.1	6.3	5.3	2.3	5.5	0.756	40.27%	-82.61%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	5.3	2.3	5.5	5.5					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-3958-2128		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(g,h,i)perylene					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.001	0.001	1	0.0625	0.8089	Non-Significant Effect					
Error	0.128	0.016	8								
Total	0.129		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-1507-2317		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 failed benzo(g,h,i)perylene				62.92%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	7.4	2.35	1.45	3	CDF	0.0026	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	46.0056		46.0056	1	70.5	6.7E-05	Significant Effect				
Error	4.57		0.652857	7							
Total	50.5756			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			74.8	24.3	0.0011	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.918	0.701	0.3782	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		4	6.85	4.9	8.8	6.95	5.6	7.9	0.612	17.86%	-197.83%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		6	Outlier	7.9	7.9	5.6					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-1872-5668		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed benzo(k)fluoranthene				44.22%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	12.5	2.13	1.02	4	CDF	1.2E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.05	2.29	0.1855	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	88.209		88.209	1	155	1.6E-06	Significant Effect				
Error	4.552		0.569	8							
Total	92.761			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			55.9	23.2	0.0018	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.941	0.741	0.5673	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	8.24	6.93	9.55	8	7.1	9.7	0.473	12.83%	-258.26%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		8	7.5	8.9	7.1	9.7					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	15-8422-8458		Endpoint:	Benzo(k)fluoranthene		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed benzo(k)fluoranthene				102.53%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	8.35	2.13	2.36	4	CDF	5.6E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1497	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	213.444	213.444	1	69.8	3.2E-05	Significant Effect					
Error	24.472	3.059	8								
Total	237.916		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			305	23.2	6.4E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.916	0.741	0.3242	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	11.5	8.47	14.6	11	8.9	15	1.1	21.40%	-401.74%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		11	8.9	15	13	9.8					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	10-5991-9650		Endpoint:	Benzo(k)fluoranthene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 failed benzo(k)fluoranthene					86.53%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	9.17	2.13	1.99	4	CDF	3.9E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.26	2.29	0.0623	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	183.184	183.184	1	84.1	1.6E-05	Significant Effect					
Error	17.432	2.179	8								
Total	200.616		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			217	23.2	1.3E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.878	0.741	0.1244	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	10.9	8.27	13.4	9.6	9.2	14	0.931	19.18%	-372.17%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		9.2	9.6	9.5	12	14					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-3657-1078		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 failed benzo(k)fluoranthene				81.30%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	2.42	2.13	1.87	4	CDF	0.0365	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.54	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	11.236		11.236	1	5.84	0.0421	Significant Effect				
Error	15.388		1.9235	8							
Total	26.624			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			191	23.2	1.6E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.865	0.741	0.0869	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	4.42	1.99	6.85	4.7	2.4	6.3	0.875	44.26%	-92.17%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	6.3	4.7	2.4	6.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-1009-2096		Endpoint:	Benzo(k)fluoranthene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:39		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 failed benzo(k)fluoranthene					156.86%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	15	n/a	0	8	Exact	0.0040	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.28	2.29	0.0527	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	570.025	570.025	1	60.6	5.3E-05	Significant Effect					
Error	75.28	9.41	8								
Total	645.305		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	940	23.2	6.8E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.786	0.741	0.0099	Non-Normal Distribution						
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	17.4	12	22.8	17	12	24	1.94	24.92%	-656.52%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		16	24	18	17	12					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-3480-7525		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed chrysene				62.85%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	15.5	1.86	1.77	8	CDF	1.5E-07	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.69	2.29	0.7047	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	546.121		546.121	1	240	3.0E-07	Significant Effect				
Error	18.168		2.271	8							
Total	564.289			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.66	23.2	0.3669	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.858	0.741	0.0731	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.4	2.1	4.8	0.498	39.52%	0.00%
31243-101		5	17.6	15.3	19.9	17	16	20	0.812	10.32%	-524.11%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	4.8	2.4					
31243-101		19	16	20	16	17					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-2627-2171		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed chrysene				123.16%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	10.9	1.86	3.47	8	CDF	2.2E-06	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.08	2.29	0.1610	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1038.36		1038.36	1	119	4.4E-06	Significant Effect				
Error	69.768		8.721	8							
Total	1108.13			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			13	23.2	0.0290	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.919	0.741	0.3507	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.4	2.1	4.8	0.498	39.52%	0.00%
31243-102		5	23.2	18.2	28.2	23	19	29	1.8	17.35%	-722.70%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	4.8	2.4					
31243-102		23	19	29	25	20					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-3604-7899		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed chrysene				80.99%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	16.9	1.86	2.28	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.97	2.29	0.2695		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	1079.52		1079.52	1	286	1.5E-07		Significant Effect			
Error	30.168		3.771	8							
Total	1109.69			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			5.07	23.2	0.1448		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.843	0.741	0.0483		Normal Distribution			
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.4	2.1	4.8	0.498	39.52%	0.00%
31243-103		5	23.6	20.5	26.7	23	20	26	1.12	10.64%	-736.88%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	4.8	2.4					
31243-103		20	26	23	23	26					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-1862-7354		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 failed chrysene				44.42%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	7.13	1.86	1.25	8	CDF	5.0E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.97	2.29	0.2636	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	57.6		57.6	1	50.8	9.9E-05	Significant Effect				
Error	9.076		1.1345	8							
Total	66.676			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.21	23.2	0.8583	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2641	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.4	2.1	4.8	0.498	39.52%	0.00%
31243-104		5	7.62	6.36	8.88	7.9	6.4	8.9	0.453	13.30%	-170.21%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	4.8	2.4					
31243-104		6.8	8.9	7.9	6.4	8.1					

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Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-6515-4273		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed chrysene				317.94%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	6.42	2.13	8.97	4	CDF	0.0015	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.11	2.29	0.1445	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1819.8		1819.8	1	41.2	2.1E-04	Significant Effect				
Error	353.768		44.221	8							
Total	2173.57			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			70.2	23.2	0.0012	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.928	0.741	0.4298	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.82	1.44	4.2	2.4	2.1	4.8	0.498	39.52%	0.00%
31243-105		5	29.8	18.2	41.4	27	19	43	4.18	31.34%	-956.74%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	4.8	2.4					
31243-105		25	43	35	27	19					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-3212-1340		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed dibenz(a,h)anthracene	7.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.16	0.02	8								
Total	0.16		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-0345-4823		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed dibenz(a,h)anthracene					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.149	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.016		0.016	1	1	0.3466	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.2	2.1	2.4	0.049	4.93%	3.48%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		2.1	2.4	2.2	2.2	2.2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 48 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-7104-7666		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed dibenz(a,h)anthracene					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.151	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0040000	0.0040000	1	0.242	0.6357	Non-Significant Effect					
Error	0.132	0.0165	8								
Total	0.136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.26	2.12	2.4	2.3	2.1	2.4	0.051	5.05%	1.74%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	2.2					

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Report Date: 05 Feb-19 15:40 (p 49 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-0301-0803		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed dibenz(a,h)anthracene	6.47%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.001	0.001	1	0.0625	0.8089	Non-Significant Effect					
Error	0.128	0.016	8								
Total	0.129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Report Date: 05 Feb-19 15:40 (p 50 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-9385-5757		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed dibenz(a,h)anthracene					6.05%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.139	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	-1.74%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	2.4	2.2	2.4	2.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-5038-5377		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed fluoranthene				75.27%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	19	1.86	4.73	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.6007	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	5837.06		5837.06	1	361	<1.0E-37	Significant Effect				
Error	129.248		16.156	8							
Total	5966.3			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.61	23.2	0.2417	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.983	0.741	0.9807	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	6.28	2.99	9.57	7.3	2.1	8.4	1.18	42.17%	0.00%
31243-101		5	54.6	48.4	60.8	53	48	61	2.25	9.21%	-769.43%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	8.4	7.3	2.1	8.3	5.3					
31243-101		61	48	58	53	53					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	18-4480-0285		Endpoint:	Fluoranthene		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed fluoranthene				135.38%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	20.1	1.86	8.5	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.2	2.29	0.0870	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	21031.4	21031.4	1	402	<1.0E-37	Significant Effect					
Error	418.048	52.256	8								
Total	21449.4		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			13.9	23.2	0.0258	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.923	0.741	0.3808	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	6.28	2.99	9.57	7.3	2.1	8.4	1.18	42.17%	0.00%
31243-102		5	98	85.7	110	96	89	113	4.42	10.08%	-1460.51%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	8.4	7.3	2.1	8.3	5.3					
31243-102		96	89	113	102	90					

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Report Date: 05 Feb-19 15:40 (p 53 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.					
Analysis ID: 18-6902-0736		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu						
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp			Comparison Result						PMSD		
Untransformed	C < T			31243-103 failed fluoranthene						112.92%		
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-103*	20.2	1.86	7.09	8	CDF	<1.0E-37	Significant Effect			
Auxiliary Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test			1.72	2.29	0.6346	No Outliers Detected					
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	14791.7		14791.7	1	407	<1.0E-37	Significant Effect					
Error	290.848		36.356	8								
Total	15082.6			9								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			9.37	23.2	0.0522	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.966	0.741	0.8474	Normal Distribution					
Fluoranthene Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	6.28	2.99	9.57	7.3	2.1	8.4	1.18	42.17%	0.00%	
31243-103		5	83.2	73.1	93.3	82	75	93	3.62	9.74%	-1224.84%	
Fluoranthene Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	8.4	7.3	2.1	8.3	5.3						
31243-103		76	90	82	75	93						

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-8319-3164		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 failed fluoranthene				54.30%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	12.2	1.86	3.41	8	CDF	9.6E-07	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7181	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1245.46		1245.46	1	148	1.9E-06	Significant Effect				
Error	67.248		8.406	8							
Total	1312.7			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.4	23.2	0.7535	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1793	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	6.28	2.99	9.57	7.3	2.1	8.4	1.18	42.17%	0.00%
31243-104		5	28.6	24.7	32.5	30	24	32	1.4	10.95%	-355.41%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	8.4	7.3	2.1	8.3	5.3					
31243-104		27	32	30	24	30					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-7922-2524		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed fluoranthene				381.57%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	6.36	2.13	24	4	CDF	0.0016	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.98	2.29	0.2533	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	12787.8		12787.8	1	40.5	2.2E-04	Significant Effect				
Error	2526.85		315.856	8							
Total	15314.6			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			89.1	23.2	7.3E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.941	0.741	0.5596	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	6.28	2.99	9.57	7.3	2.1	8.4	1.18	42.17%	0.00%
31243-105		5	77.8	46.8	109	68	48	111	11.2	32.13%	-1138.85%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	8.4	7.3	2.1	8.3	5.3					
31243-105		68	111	95	67	48					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-7099-1216		Endpoint: Fluorene		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed fluorene				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.16	0.02	8								
Total	0.16		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-2090-0971		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed fluorene					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.149	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.016		0.016	1	1	0.3466	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.2	2.1	2.4	0.049	4.93%	3.48%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		2.1	2.4	2.2	2.2	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-7696-8294		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed fluorene				6.57%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.151	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.0040000		0.0040000	1	0.242	0.6357		Non-Significant Effect			
Error	0.132		0.0165	8							
Total	0.136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			1.54	23.2	0.6866		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779		Normal Distribution			
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.26	2.12	2.4	2.3	2.1	2.4	0.051	5.05%	1.74%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-7066-5749		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed fluorene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-7059-9297		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed fluorene				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.139	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	-1.74%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	2.4	2.2	2.4	2.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-4319-2402		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed indeno(1,2,3-cd)pyrene	7.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.16	0.02	8								
Total	0.16		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-0452-1480		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed indeno(1,2,3-cd)pyrene					7.46%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.828	1.89	0.172	7	CDF	0.7826	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0125		0.0125	1	0.686	0.4348	Non-Significant Effect				
Error	0.1275		0.0182143	7							
Total	0.14			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.26	46.2	0.8828	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.935	0.701	0.5283	Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		4	2.23	2.02	2.43	2.2	2.1	2.4	0.0629	5.66%	3.26%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		2.1	2.4	Outlier	2.2	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-4800-8548		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed indeno(1,2,3-cd)pyrene				39.74%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	27	n/a	2	8	Exact	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.65	2.29	9.5E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.529	0.529	1	0.876	0.3767	Non-Significant Effect					
Error	4.832	0.604	8								
Total	5.361		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		59.4	23.2	0.0016	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.713	0.741	0.0013	Non-Normal Distribution					
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.76	1.41	4.11	2.3	2.1	4.7	0.487	39.49%	-20.00%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	4.7					

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Report Date: 05 Feb-19 15:40 (p 64 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-3695-5345		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed indeno(1,2,3-cd)pyrene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 65 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-1034-4719		Endpoint:	Indeno(1,2,3-cd)pyrene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:39		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 failed indeno(1,2,3-cd)pyrene					113.71%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	2.2	2.13	2.62	4	CDF	0.0463	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.86	2.29	0.4055	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	18.225	18.225	1	4.84	0.0589	Non-Significant Effect					
Error	30.1	3.7625	8								
Total	48.325		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	375	23.2	4.2E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.888	0.741	0.1598	Normal Distribution						
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	5	1.6	8.4	5.3	2.2	8.4	1.23	54.79%	-117.39%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		5.3	8.4	2.2	6.8	2.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-9452-0586		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed naphthalene				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0	1.86	0.166	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.16		0.02	8							
Total	0.16			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	0.00%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-0779-7137		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed naphthalene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.149	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.016		0.016	1	1	0.3466	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-102		5	2.22	2.08	2.36	2.2	2.1	2.4	0.049	4.93%	3.48%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-102		2.1	2.4	2.2	2.2	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-2797-1984		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed naphthalene					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.151	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0040000		0.0040000	1	0.242	0.6357	Non-Significant Effect				
Error	0.132		0.0165	8							
Total	0.136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-103		5	2.26	2.12	2.4	2.3	2.1	2.4	0.051	5.05%	1.74%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-103		2.4	2.1	2.3	2.3	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-0879-8652		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed naphthalene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.149	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0625	0.8089	Non-Significant Effect				
Error	0.128		0.016	8							
Total	0.129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-104		5	2.28	2.14	2.42	2.2	2.2	2.4	0.049	4.80%	0.87%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-104		2.4	2.2	2.2	2.4	2.2					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma										EnviroSystems, Inc.	
Analysis ID: 21-0306-2091		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed naphthalene				6.05%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.139	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.286	0.6075	Non-Significant Effect					
Error	0.112	0.014	8								
Total	0.116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.3	2.12	2.48	2.4	2.1	2.4	0.0632	6.15%	0.00%
31243-105		5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	-1.74%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.4	2.4	2.1	2.2	2.4					
31243-105		2.4	2.4	2.2	2.4	2.3					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-6451-6280		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:38		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed phenanthrene				48.53%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	7.46	1.86	2.03	8	CDF	3.6E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.67	2.29	0.7395		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	165.649		165.649	1	55.7	7.2E-05		Significant Effect			
Error	23.796		2.9745	8							
Total	189.445			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			1.12	23.2	0.9181		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.862	0.741	0.0801		Normal Distribution			
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	5.3	2.1	5.7	0.792	42.37%	0.00%
31243-101		5	12.3	10.2	14.4	13	9.6	14	0.75	13.61%	-194.74%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5.3	5.4	2.1	5.7	2.4					
31243-101		14	9.6	13	13	12					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-7517-1226		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed phenanthrene				46.39%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	11.7	1.86	1.94	8	CDF	1.3E-06	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.54	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	373.321		373.321	1	137	2.6E-06	Significant Effect				
Error	21.748		2.7185	8							
Total	395.069			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.36	23.2	0.7709	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.854	0.741	0.0643	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	5.3	2.1	5.7	0.792	42.37%	0.00%
31243-102		5	16.4	14.5	18.3	17	14	18	0.678	9.25%	-292.34%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5.3	5.4	2.1	5.7	2.4					
31243-102		17	14	18	17	16					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-3299-6093		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed phenanthrene				63.34%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	12.5	1.86	2.65	8	CDF	7.8E-07	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.88	2.29	0.3699	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	793.881		793.881	1	157	1.6E-06	Significant Effect				
Error	40.548		5.0685	8							
Total	834.429			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.23	23.2	0.4561	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.919	0.741	0.3469	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	5.3	2.1	5.7	0.792	42.37%	0.00%
31243-103		5	22	18.7	25.3	23	18	25	1.18	12.03%	-426.32%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5.3	5.4	2.1	5.7	2.4					
31243-103		21	25	23	18	23					

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Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-7683-9029		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 failed phenanthrene				37.56%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	3.25	1.86	1.57	8	CDF	0.0059	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7837	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	18.769		18.769	1	10.5	0.0118	Significant Effect				
Error	14.256		1.782	8							
Total	33.025			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			7.35	23.2	0.0792	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.927	0.741	0.4201	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	5.3	2.1	5.7	0.792	42.37%	0.00%
31243-104		5	6.92	6.11	7.73	6.8	6.1	7.8	0.292	9.44%	-65.55%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5.3	5.4	2.1	5.7	2.4					
31243-104		7.8	7.3	6.6	6.1	6.8					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 75 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-6278-9935		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 failed phenanthrene					75.18%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	3.81	1.86	3.14	8	CDF	0.0026	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.6062	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	103.684	103.684	1	14.5	0.0052	Significant Effect					
Error	57.116	7.1395	8								
Total	160.8		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.55	23.2	0.2472	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.959	0.741	0.7689	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	4.18	1.98	6.38	5.3	2.1	5.7	0.792	42.37%	0.00%
31243-105		5	10.6	6.48	14.8	9.6	6.7	15	1.49	31.43%	-154.07%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	5.3	5.4	2.1	5.7	2.4					
31243-105		8.8	15	13	9.6	6.7					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 76 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	21-2343-7091		Endpoint:	Pyrene		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:38		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed pyrene				34.17%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	21.1	1.86	3.18	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.81	2.29	0.4883	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3258.02	3258.02	1	446	<1.0E-37	Significant Effect					
Error	58.42	7.3025	8								
Total	3316.44		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.52	23.2	0.6967	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.964	0.741	0.8346	Normal Distribution				
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	9.5	5.9	12	1.08	25.91%	0.00%
31243-101		5	45.4	41.7	49.1	45	42	50	1.33	6.53%	-388.17%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	9.5	5.9	12	8.1					
31243-101		50	42	46	44	45					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 77 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-9755-8167	Endpoint:	Pyrene	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:39	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed pyrene				68.16%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	18.6	1.86	6.34	8	CDF	<1.0E-37	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.89	2.29	0.3637	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	10017.2	10017.2	1	345	<1.0E-37	Significant Effect					
Error	232.42	29.0525	8								
Total	10249.6		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			9.01	23.2	0.0559	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.976	0.741	0.9427	Normal Distribution				
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	9.5	5.9	12	1.08	25.91%	0.00%
31243-102		5	72.6	63.6	81.6	71	63	82	3.23	9.96%	-680.65%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	9.5	5.9	12	8.1					
31243-102		71	70	82	77	63					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 78 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-7641-4731		Endpoint: Pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed pyrene				71.87%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	15.3	1.86	6.68	8	CDF	1.6E-07	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.75	2.29	0.5773		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	7590.02		7590.02	1	235	3.3E-07		Significant Effect			
Error	258.42		32.3025	8							
Total	7848.44			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			10.1	23.2	0.0455		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.986	0.741	0.9891		Normal Distribution			
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	9.5	5.9	12	1.08	25.91%	0.00%
31243-103		5	64.4	54.9	73.9	64	55	73	3.43	11.91%	-592.47%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	9.5	5.9	12	8.1					
31243-103		55	71	64	59	73					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 79 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-3225-3392		Endpoint: Pyrene		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 failed pyrene				38.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	7.41	1.86	3.54	8	CDF	3.8E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.9	2.29	0.3444	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	497.025	497.025	1	54.9	7.5E-05	Significant Effect					
Error	72.42	9.0525	8								
Total	569.445		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.12	23.2	0.4850	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.936	0.741	0.5128	Normal Distribution						
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	9.5	5.9	12	1.08	25.91%	0.00%
31243-104		5	23.4	19	27.8	25	18	27	1.57	14.99%	-151.61%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	9.5	5.9	12	8.1					
31243-104		22	27	25	18	25					

CETIS Analytical Report

Report Date: 05 Feb-19 15:40 (p 80 of 80)
Test Code: 31249Mn-PAH | 00-7863-7571

Bioaccumulation Evaluation - PAHs - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-1010-3075		Endpoint: Pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:39		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed pyrene				299.29%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	7.94	2.13	27.8	4	CDF	6.8E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.21	2.29	0.0828	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	26884.2		26884.2	1	63.1	4.6E-05	Significant Effect				
Error	3409.22		426.152	8							
Total	30293.4			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			146	23.2	2.8E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.915	0.741	0.3188	Normal Distribution				
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	9.3	6.31	12.3	9.5	5.9	12	1.08	25.91%	0.00%
31243-105		5	113	76.9	149	102	81	156	13	25.75%	-1115.05%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	9.5	5.9	12	8.1					
31243-105		102	156	127	99	81					

Macoma nasuta
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
PCB Congeners

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
PCB Congeners (ng/g wet wt.)						
PCB 8	0.25	U	0.23	U	0.23	U
PCB 18	0.25	U	0.93	J	0.23	U
PCB 28	0.25	U	0.23	U	0.23	U
PCB 44	0.25	U	0.23	U	0.23	U
PCB 52	0.25	U	0.23	U	0.23	U
PCB 66	0.25	U	0.23	U	0.23	U
PCB 101	0.25	U	0.23	U	0.23	U
PCB 105	0.25	U	0.23	U	0.23	U
PCB 118	0.25	U	0.23	U	0.23	U
PCB 128	0.25	U	0.23	U	0.23	U
PCB 138	0.25	U	0.23	U	0.23	U
PCB 153	0.25	U	0.23	U	0.23	U
PCB 170	0.25	U	0.23	U	0.23	U
PCB 180	0.25	U	0.23	U	0.23	U
PCB 187	0.25	U	0.23	U	0.23	U
PCB 195	0.25	U	0.23	U	0.23	U
PCB 206	0.25	U	0.23	U	0.23	U
PCB 209	0.25	U	0.23	U	0.23	U
Total PCBs	8.9		9.8		8.2	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 18	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 28	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 44	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 52	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 66	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 101	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 105	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 118	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 128	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 138	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 153	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 170	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 180	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 187	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 195	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 206	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
PCB 209	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Total PCBs	8.8		8.6		7.7		7.8		8.8	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.22	U	0.22	U	0.25	U	1.1		0.24	U
PCB 18	0.22	U	0.22	U	0.25	U	3.6		0.24	U
PCB 28	0.22	U	0.70	J	0.25	U	9.5		0.24	U
PCB 44	0.58	J	0.46	J	0.50	J	0.22	U	0.24	U
PCB 52	1.4		1.3		1.3		0.92		1.4	
PCB 66	0.67	J	0.75	J	0.58	J	0.54	J	0.62	J
PCB 101	1.3		1.1		1.2		1.1		1.1	
PCB 105	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 118	0.71	J	0.63	J	0.65	J	0.49	J	0.57	J
PCB 128	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 138	0.90		0.69	J	1.0		0.79	J	0.74	J
PCB 153	0.90		0.76	J	0.89	J	0.65	J	0.76	J
PCB 170	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 180	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 187	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 195	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 206	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 209	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Total PCBs	18		17		18		41		16	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 18	1.7		1.2		1.8		2.6		1.8	
PCB 28	1.1		1.0		0.45	J	0.22	U	0.22	U
PCB 44	0.47	J	0.24	U	0.62	J	0.22	U	0.22	U
PCB 52	1.6		1.4		1.6		1.4		1.0	
PCB 66	0.49	J	0.60	J	0.77	J	0.51	J	0.46	J
PCB 101	0.78	J	0.86	J	1.0		0.86	J	0.62	J
PCB 105	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 118	0.57	J	0.24	U	0.63	J	0.45	J	0.22	U
PCB 128	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 138	0.91		0.58	J	0.91		0.66	J	0.56	J
PCB 153	0.78	J	0.53	J	0.79	J	0.70	J	0.63	J
PCB 170	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 180	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 187	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 195	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 206	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
PCB 209	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Total PCBs	21		17		21		19		15	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 18	1.8		0.94		1.8		1.6		1.2	
PCB 28	0.86	J	0.73	J	0.74	J	0.81	J	0.88	J
PCB 44	0.68	J	0.67	J	0.23	U	0.52	J	0.90	
PCB 52	1.6		1.7		1.6		1.7		2.3	
PCB 66	0.79	J	0.99		0.82	J	0.87	J	1.0	
PCB 101	1.1		1.6		1.4		1.3		1.5	
PCB 105	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 118	0.77	J	1.0		0.89	J	0.81	J	1.0	
PCB 128	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 138	0.96	J	1.3		1.3		1.1		1.4	
PCB 153	0.88	J	1.2		0.95		0.96		1.1	
PCB 170	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 180	0.24	U	0.21	U	0.23	U	0.61	J	0.22	U
PCB 187	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 195	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 206	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
PCB 209	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Total PCBs	23		24		24		24		27	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 18	1.2		1.3		0.22	U	0.24	U	0.22	U
PCB 28	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 44	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 52	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 66	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 101	0.24	U	0.51	J	0.22	U	0.24	U	0.68	J
PCB 105	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 118	0.24	U	0.22	U	0.45	J	0.24	U	0.22	U
PCB 128	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 138	0.24	U	0.47	J	0.22	U	0.24	U	0.46	J
PCB 153	0.24	U	0.45	J	0.22	U	0.24	U	0.46	J
PCB 170	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 180	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 187	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 195	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 206	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
PCB 209	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Total PCBs	11		12		8.3		8.7		9.8	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 18	0.24	U	1.7		0.22	U	0.24	U	0.23	U
PCB 28	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 44	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 52	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 66	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 101	0.24	U	0.57	J	0.22	U	0.24	U	0.23	U
PCB 105	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 118	0.24	U	0.53	J	0.22	U	0.24	U	0.23	U
PCB 128	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 138	0.24	U	0.62	J	0.22	U	0.24	U	0.23	U
PCB 153	0.24	U	0.49	J	0.22	U	0.24	U	0.23	U
PCB 170	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 180	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 187	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 195	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 206	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
PCB 209	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Total PCBs	8.7		14		8.0		8.7		8.1	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:05 (p 1 of 1)
Test Code/ID: 17-7443-8782/31249Mn-PCB

Bioaccumulation Evaluation - PCB Congeners - Macoma **EnviroSystems, Inc.**

Start Date: 21 Nov-18 12:03 **Species:** Macoma nasuta **Sample Code:** 31249-000
End Date: 19 Dec-18 12:03 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 21 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Mn)

Sample	Rep	Pos	PBC 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 183	PCB 184	Total PCBs		
31242-008	1	1	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24			
31242-008	2	12	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.48		
31242-008	3	13	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21		
31242-008	4	19	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		
31242-008	5	30	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-101	1	2	0.22	0.22	0.22	0.58	1.4	0.67	1.3	0.22	0.71	0.22	0.9	0.9	0.22	0.22	0.22	0.22	0.22	0.22	0.22	1	0.22	0.22			
31243-101	2	10	0.22	0.22	0.7	0.46	1.3	0.75	1.1	0.22	0.63	0.22	0.69	0.76	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.83	0.22	0.22			
31243-101	3	17	0.25	0.25	0.25	0.5	1.3	0.58	1.2	0.25	0.65	0.25	1	0.89	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.94	0.25	0.25			
31243-101	4	21	1.1	3.6	9.5	0.22	0.92	0.54	1.1	0.22	0.49	0.22	0.79	0.65	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.72	0.22	0.22			
31243-101	5	26	0.24	0.24	0.24	0.24	1.4	0.62	1.1	0.24	0.57	0.24	0.74	0.76	0.24	0.24	0.24	0.24	0.24	0.24	1	0.24	0.24				
31243-102	1	6	0.21	1.7	1.1	0.47	1.6	0.49	0.78	0.21	0.57	0.21	0.91	0.78	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.92	0.21	0.21			
31243-102	2	11	0.24	1.2	1	0.24	1.4	0.6	0.86	0.24	0.24	0.24	0.58	0.53	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.77	0.24	0.24			
31243-102	3	18	0.22	1.8	0.45	0.62	1.6	0.77	1	0.22	0.63	0.22	0.91	0.79	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.82	0.22	0.22			
31243-102	4	23	0.22	2.6	0.22	0.22	1.4	0.51	0.86	0.22	0.45	0.22	0.66	0.7	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.86	0.22	0.22			
31243-102	5	25	0.22	1.8	0.22	0.22	1	0.46	0.62	0.22	0.22	0.22	0.56	0.63	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.68	0.22	0.22			
31243-103	1	4	0.24	1.8	0.86	0.68	1.6	0.79	1.1	0.24	0.77	0.24	0.96	0.88	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.94	0.24	0.24			
31243-103	2	8	0.21	0.94	0.73	0.67	1.7	0.99	1.6	0.21	1	0.21	1.3	1.2	0.21	0.21	0.21	0.21	0.21	0.21	0.21	1.3	0.21	0.21			
31243-103	3	14	0.23	1.8	0.74	0.23	1.6	0.82	1.4	0.23	0.89	0.23	1.3	0.95	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.2	0.23	0.23			
31243-103	4	22	0.23	1.6	0.81	0.52	1.7	0.87	1.3	0.23	0.81	0.23	1.1	0.96	0.23	0.61	0.23	0.23	0.23	0.23	0.23	0.98	0.23	0.23			
31243-103	5	27	0.22	1.2	0.88	0.9	2.3	1	1.5	0.22	1	0.22	1.4	1.1	0.22	0.22	0.22	0.22	0.22	0.22	0.22	1.3	0.22	0.22			
31243-104	1	3	0.24	1.2	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-104	2	9	0.22	1.3	0.22	0.22	0.22	0.22	0.51	0.22	0.22	0.22	0.47	0.45	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		
31243-104	3	15	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.45	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		
31243-104	4	24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-104	5	28	0.22	0.22	0.22	0.22	0.22	0.22	0.68	0.22	0.22	0.22	0.46	0.46	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		
31243-105	1	5	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-105	2	7	0.24	1.7	0.24	0.24	0.24	0.24	0.57	0.24	0.53	0.24	0.62	0.49	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-105	3	16	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		
31243-105	4	20	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24		
31243-105	5	29	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23		

CETIS Summary Report

Report Date: 05 Feb-19 15:46 (p 1 of 11)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma **EnviroSystems, Inc.**

Batch ID: 00-9494-6438	Test Type: Bioaccumulation - PCBs - Mn	Analyst: Nancy Roka
Start Date: 21 Nov-18 12:03	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 19 Dec-18 12:03	Species: Macoma nasuta	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
02-1119-3513	PCB 008	Equal Variance t Two-Sample Test	0.4024	31243-101 passed pcb 008
15-5115-7714	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.2619	31243-101 passed pcb 008
10-2806-4013	PCB 008	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 008
11-0482-8785	PCB 008	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 008
08-6856-6673	PCB 008	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 008
11-7003-1131	PCB 008	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 008
01-9432-5804	PCB 018	Equal Variance t Two-Sample Test	0.4024	31243-101 passed pcb 018
18-5237-1556	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.2619	31243-101 passed pcb 018
11-2199-9586	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-102 failed pcb 018
15-5030-1590	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.0079	31243-102 failed pcb 018
05-5946-4600	PCB 018	Unequal Variance t Two-Sample Test	9.8E-04	31243-103 failed pcb 018
19-6143-1880	PCB 018	Unequal Variance t Two-Sample Test	0.0907	31243-104 passed pcb 018
15-5643-4290	PCB 018	Equal Variance t Two-Sample Test	0.3862	31243-105 passed pcb 018
04-8276-7602	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-105 passed pcb 018
07-1289-3142	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.1429	31243-101 passed pcb 028
13-9341-1369	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.0714	31243-101 passed pcb 028
04-8990-0680	PCB 028	Unequal Variance t Two-Sample Test	0.0624	31243-102 passed pcb 028
08-8455-6280	PCB 028	Unequal Variance t Two-Sample Test	2.5E-05	31243-103 failed pcb 028
10-4966-7768	PCB 028	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 028
09-7187-1647	PCB 028	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 028
07-1820-1441	PCB 044	Unequal Variance t Two-Sample Test	0.0393	31243-101 failed pcb 044
13-9068-6664	PCB 044	Unequal Variance t Two-Sample Test	0.1021	31243-102 passed pcb 044
13-3427-6458	PCB 044	Unequal Variance t Two-Sample Test	0.0144	31243-103 failed pcb 044
00-8103-6882	PCB 044	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 044
03-1794-3809	PCB 044	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 044
00-9874-4482	PCB 049	Unequal Variance t Two-Sample Test	1.3E-04	31243-101 failed pcb 049
00-6901-6953	PCB 049	Unequal Variance t Two-Sample Test	7.4E-05	31243-102 failed pcb 049
12-9965-1139	PCB 049	Unequal Variance t Two-Sample Test	1.5E-04	31243-103 failed pcb 049
10-6328-7617	PCB 049	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 049
09-1545-6113	PCB 049	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 049
02-9556-5625	PCB 052	Equal Variance t Two-Sample Test	<1.0E-37	31243-101 failed pcb 052
14-0417-2866	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-101 failed pcb 052
14-4851-5873	PCB 052	Unequal Variance t Two-Sample Test	1.0E-04	31243-102 failed pcb 052

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma **EnviroSystems, Inc.**

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
14-1386-8034	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-102 failed pcb 052
11-0925-7890	PCB 052	Equal Variance t Two-Sample Test	<1.0E-37	31243-103 failed pcb 052
16-1968-7828	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-103 failed pcb 052
02-0173-6432	PCB 052	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 052
20-8794-7343	PCB 052	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 052
05-3771-6910	PCB 066	Unequal Variance t Two-Sample Test	2.1E-04	31243-101 failed pcb 066
18-3186-9614	PCB 066	Equal Variance t Two-Sample Test	8.3E-06	31243-102 failed pcb 066
17-1514-2181	PCB 066	Unequal Variance t Two-Sample Test	0.0020	31243-102 failed pcb 066
15-4770-3524	PCB 066	Unequal Variance t Two-Sample Test	5.4E-05	31243-103 failed pcb 066
10-9958-0807	PCB 066	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 066
09-3938-8251	PCB 066	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 066
16-6724-2778	PCB 087	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 087
15-6833-2720	PCB 087	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 087
19-1248-2477	PCB 087	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 087
16-1703-1319	PCB 087	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 087
11-1818-5802	PCB 087	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 087
01-8778-6376	PCB 101	Unequal Variance t Two-Sample Test	1.1E-05	31243-101 failed pcb 101
15-7670-8102	PCB 101	Wilcoxon Rank Sum Two-Sample Test	0.0079	31243-101 failed pcb 101
16-8112-4591	PCB 101	Unequal Variance t Two-Sample Test	3.4E-04	31243-102 failed pcb 101
14-0467-3815	PCB 101	Unequal Variance t Two-Sample Test	9.1E-05	31243-103 failed pcb 101
15-7169-1637	PCB 101	Unequal Variance t Two-Sample Test	0.0931	31243-104 passed pcb 101
08-5164-9285	PCB 101	Equal Variance t Two-Sample Test	0.3862	31243-105 passed pcb 101
10-6177-4696	PCB 101	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-105 passed pcb 101
02-0801-0401	PCB 105	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 105
01-8325-3721	PCB 105	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 105
12-3788-7330	PCB 105	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 105
16-9547-6975	PCB 105	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 105
02-5793-9599	PCB 105	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 105
02-5081-1861	PCB 118	Unequal Variance t Two-Sample Test	2.8E-04	31243-101 failed pcb 118
00-6586-5248	PCB 118	Unequal Variance t Two-Sample Test	0.0420	31243-102 failed pcb 118
02-0970-2531	PCB 118	Unequal Variance t Two-Sample Test	7.8E-05	31243-103 failed pcb 118
01-2619-4768	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.5952	31243-104 passed pcb 118
01-8969-7758	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.3611	31243-104 passed pcb 118
12-7819-7114	PCB 118	Equal Variance t Two-Sample Test	0.3862	31243-105 passed pcb 118
01-0911-3673	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-105 passed pcb 118
07-2961-3022	PCB 128	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 128
18-5327-5959	PCB 128	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 128
04-9019-9025	PCB 128	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 128
07-8543-9491	PCB 128	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 128
12-4991-4209	PCB 128	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 128
06-9363-1134	PCB 138	Unequal Variance t Two-Sample Test	2.3E-04	31243-101 failed pcb 138
01-7735-9706	PCB 138	Unequal Variance t Two-Sample Test	0.0016	31243-102 failed pcb 138
14-5268-4866	PCB 138	Unequal Variance t Two-Sample Test	1.3E-04	31243-103 failed pcb 138
00-2151-5839	PCB 138	Unequal Variance t Two-Sample Test	0.0844	31243-104 passed pcb 138
06-0056-0249	PCB 138	Equal Variance t Two-Sample Test	0.3862	31243-105 passed pcb 138
18-5212-3470	PCB 138	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-105 passed pcb 138
09-7680-8230	PCB 153	Unequal Variance t Two-Sample Test	1.4E-04	31243-101 failed pcb 153
14-4344-3612	PCB 153	Unequal Variance t Two-Sample Test	3.7E-04	31243-102 failed pcb 153
17-7508-5716	PCB 153	Unequal Variance t Two-Sample Test	8.6E-05	31243-103 failed pcb 153
06-0738-4697	PCB 153	Unequal Variance t Two-Sample Test	0.0843	31243-104 passed pcb 153
01-8485-0840	PCB 153	Equal Variance t Two-Sample Test	0.3862	31243-105 passed pcb 153
01-7068-7934	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-105 passed pcb 153
10-1161-9596	PCB 170	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 170

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
16-3627-8230	PCB 170	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 170
20-1276-8387	PCB 170	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 170
07-9453-6606	PCB 170	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 170
10-3634-8794	PCB 170	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 170
10-0239-0617	PCB 180	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 180
20-1860-0580	PCB 180	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 180
13-6240-7515	PCB 180	Equal Variance t Two-Sample Test	0.6993	31243-103 passed pcb 180
14-8709-4302	PCB 180	Wilcoxon Rank Sum Two-Sample Test	0.5635	31243-103 passed pcb 180
15-1649-9218	PCB 180	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 180
02-6417-2610	PCB 180	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 180
11-9230-7239	PCB 183	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 183
01-4022-3639	PCB 183	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 183
09-1241-7529	PCB 183	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 183
07-8933-5706	PCB 183	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 183
05-1050-5638	PCB 183	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 183
03-6134-3183	PCB 184	Equal Variance t Two-Sample Test	0.4024	31243-101 passed pcb 184
13-3555-5187	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.6190	31243-101 passed pcb 184
01-3515-6926	PCB 184	Equal Variance t Two-Sample Test	0.7282	31243-102 passed pcb 184
13-3748-5018	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.8810	31243-102 passed pcb 184
10-2570-8369	PCB 184	Equal Variance t Two-Sample Test	0.5655	31243-103 passed pcb 184
04-3694-3199	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.8135	31243-103 passed pcb 184
04-9455-5724	PCB 184	Equal Variance t Two-Sample Test	0.4777	31243-104 passed pcb 184
08-4112-5558	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.7540	31243-104 passed pcb 184
01-5957-8988	PCB 184	Equal Variance t Two-Sample Test	0.2216	31243-105 passed pcb 184
08-3852-6539	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.5794	31243-105 passed pcb 184
10-5290-1600	PCB 187	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 187
20-4069-1199	PCB 187	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 187
10-3211-5403	PCB 187	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 187
13-9446-4047	PCB 187	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 187
20-8778-0616	PCB 187	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 187
06-1281-6677	PCB 195	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 195
02-6842-0056	PCB 195	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 195
16-0166-1825	PCB 195	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 195
18-4067-9679	PCB 195	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 195
07-1087-0723	PCB 195	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 195
02-5269-2630	PCB 206	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 206
19-5456-5449	PCB 206	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 206
01-8283-7491	PCB 206	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 206
13-6313-4325	PCB 206	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 206
09-5247-7608	PCB 206	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 206
04-8798-3621	PCB 209	Equal Variance t Two-Sample Test	0.5000	31243-101 passed pcb 209
09-5524-8741	PCB 209	Equal Variance t Two-Sample Test	0.8267	31243-102 passed pcb 209
00-7238-8844	PCB 209	Equal Variance t Two-Sample Test	0.6822	31243-103 passed pcb 209
20-8636-9116	PCB 209	Equal Variance t Two-Sample Test	0.5956	31243-104 passed pcb 209
07-2103-6241	PCB 209	Equal Variance t Two-Sample Test	0.3038	31243-105 passed pcb 209

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma											EnviroSystems, Inc.
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.406	-0.076	0.888	0.22	1.1	0.174	0.388	95.61%	-76.52%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.906	-0.964	2.78	0.22	3.6	0.674	1.51	166.23%	-293.91%
31243-102		5	1.82	1.2	2.44	1.2	2.6	0.224	0.502	27.58%	-691.30%
31243-103		5	1.47	0.992	1.94	0.94	1.8	0.172	0.384	26.13%	-538.26%
31243-104		5	0.636	-0.0614	1.33	0.22	1.3	0.251	0.562	88.31%	-176.52%
31243-105		5	0.526	-0.289	1.34	0.22	1.7	0.294	0.656	124.78%	-128.70%
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	2.18	-2.9	7.27	0.22	9.5	1.83	4.1	187.71%	-848.70%
31243-102		5	0.598	0.0707	1.13	0.22	1.1	0.19	0.425	71.01%	-160.00%
31243-103		5	0.804	0.72	0.888	0.73	0.88	0.0304	0.068	8.46%	-249.57%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.4	0.2	0.6	0.22	0.58	0.0721	0.161	40.31%	-73.91%
31243-102		5	0.354	0.127	0.581	0.22	0.62	0.0816	0.182	51.53%	-53.91%
31243-103		5	0.6	0.293	0.907	0.23	0.9	0.111	0.247	41.21%	-160.87%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.898	0.747	1.05	0.72	1	0.0543	0.121	13.51%	-290.43%
31243-102		5	0.81	0.697	0.923	0.68	0.92	0.0407	0.0911	11.25%	-252.17%
31243-103		5	1.14	0.929	1.36	0.94	1.3	0.0776	0.173	15.16%	-397.39%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	1.26	1.02	1.51	0.92	1.4	0.0889	0.199	15.72%	-449.57%
31243-102		5	1.4	1.1	1.7	1	1.6	0.11	0.245	17.50%	-508.70%
31243-103		5	1.78	1.41	2.15	1.6	2.3	0.132	0.295	16.57%	-673.91%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

CETIS Summary Report

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma											EnviroSystems, Inc.
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.632	0.531	0.733	0.54	0.75	0.0365	0.0817	12.92%	-174.78%
31243-102		5	0.566	0.41	0.722	0.46	0.77	0.0561	0.125	22.16%	-146.09%
31243-103		5	0.894	0.774	1.01	0.79	1	0.0432	0.0966	10.80%	-288.70%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	1.16	1.05	1.27	1.1	1.3	0.04	0.0894	7.71%	-404.35%
31243-102		5	0.824	0.652	0.996	0.62	1	0.0621	0.139	16.85%	-258.26%
31243-103		5	1.38	1.14	1.62	1.1	1.6	0.086	0.192	13.94%	-500.00%
31243-104		5	0.378	0.121	0.635	0.22	0.68	0.0926	0.207	54.81%	-64.35%
31243-105		5	0.3	0.112	0.488	0.22	0.57	0.0676	0.151	50.39%	-30.43%
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.61	0.506	0.714	0.49	0.71	0.0374	0.0837	13.72%	-165.22%
31243-102		5	0.422	0.19	0.654	0.22	0.63	0.0836	0.187	44.31%	-83.48%
31243-103		5	0.894	0.762	1.03	0.77	1	0.0474	0.106	11.85%	-288.70%
31243-104		5	0.274	0.151	0.397	0.22	0.45	0.0442	0.0989	36.09%	-19.13%
31243-105		5	0.292	0.126	0.458	0.22	0.53	0.0596	0.133	45.65%	-26.96%
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

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Bioaccumulation Evaluation - PCB Congeners - Macoma											EnviroSystems, Inc.
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.824	0.668	0.98	0.69	1	0.0561	0.125	15.22%	-258.26%
31243-102		5	0.724	0.508	0.94	0.56	0.91	0.0778	0.174	24.01%	-214.78%
31243-103		5	1.21	0.991	1.43	0.96	1.4	0.0796	0.178	14.69%	-426.96%
31243-104		5	0.326	0.168	0.484	0.22	0.47	0.0569	0.127	39.02%	-41.74%
31243-105		5	0.31	0.0946	0.525	0.22	0.62	0.0776	0.173	55.97%	-34.78%
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.792	0.663	0.921	0.65	0.9	0.0466	0.104	13.16%	-244.35%
31243-102		5	0.686	0.551	0.821	0.53	0.79	0.0486	0.109	15.86%	-198.26%
31243-103		5	1.02	0.857	1.18	0.88	1.2	0.0578	0.129	12.70%	-342.61%
31243-104		5	0.322	0.171	0.473	0.22	0.46	0.0544	0.122	37.81%	-40.00%
31243-105		5	0.284	0.141	0.427	0.22	0.49	0.0516	0.115	40.65%	-23.48%
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.302	0.0878	0.516	0.21	0.61	0.0772	0.173	57.13%	-31.30%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.278	0.137	0.419	0.21	0.48	0.0508	0.114	40.89%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	17.27%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	20.14%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	18.71%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	17.99%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	15.83%

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Bioaccumulation Evaluation - PCB Congeners - Macoma											EnviroSystems, Inc.
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.
PCB 008 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	1.1	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 018 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	3.6	0.24	
31243-102		1.7	1.2	1.8	2.6	1.8	
31243-103		1.8	0.94	1.8	1.6	1.2	
31243-104		1.2	1.3	0.22	0.24	0.22	
31243-105		0.24	1.7	0.22	0.24	0.23	
PCB 028 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.7	0.25	9.5	0.24	
31243-102		1.1	1	0.45	0.22	0.22	
31243-103		0.86	0.73	0.74	0.81	0.88	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 044 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.58	0.46	0.5	0.22	0.24	
31243-102		0.47	0.24	0.62	0.22	0.22	
31243-103		0.68	0.67	0.23	0.52	0.9	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 049 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		1	0.83	0.94	0.72	1	
31243-102		0.92	0.77	0.82	0.86	0.68	
31243-103		0.94	1.3	1.2	0.98	1.3	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 052 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		1.4	1.3	1.3	0.92	1.4	
31243-102		1.6	1.4	1.6	1.4	1	
31243-103		1.6	1.7	1.6	1.7	2.3	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.
PCB 066 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.67	0.75	0.58	0.54	0.62	
31243-102		0.49	0.6	0.77	0.51	0.46	
31243-103		0.79	0.99	0.82	0.87	1	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 087 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 101 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		1.3	1.1	1.2	1.1	1.1	
31243-102		0.78	0.86	1	0.86	0.62	
31243-103		1.1	1.6	1.4	1.3	1.5	
31243-104		0.24	0.51	0.22	0.24	0.68	
31243-105		0.24	0.57	0.22	0.24	0.23	
PCB 105 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 118 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.71	0.63	0.65	0.49	0.57	
31243-102		0.57	0.24	0.63	0.45	0.22	
31243-103		0.77	1	0.89	0.81	1	
31243-104		0.24	0.22	0.45	0.24	0.22	
31243-105		0.24	0.53	0.22	0.24	0.23	
PCB 128 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.
PCB 138 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.9	0.69	1	0.79	0.74	
31243-102		0.91	0.58	0.91	0.66	0.56	
31243-103		0.96	1.3	1.3	1.1	1.4	
31243-104		0.24	0.47	0.22	0.24	0.46	
31243-105		0.24	0.62	0.22	0.24	0.23	
PCB 153 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.9	0.76	0.89	0.65	0.76	
31243-102		0.78	0.53	0.79	0.7	0.63	
31243-103		0.88	1.2	0.95	0.96	1.1	
31243-104		0.24	0.45	0.22	0.24	0.46	
31243-105		0.24	0.49	0.22	0.24	0.23	
PCB 170 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 180 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.61	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 183 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 184 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.48	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.
PCB 187 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 195 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 206 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
PCB 209 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	23.5		0.2619048	0.05	FALSE		8	2	E
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0.2567363	1.89458	0.4023824	0.05	FALSE	0.0184487	7		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	23.5		0.2619048	0.05	FALSE		8	2	E
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0.2567363	1.89458	0.4023824	0.05	FALSE	0.0184487	7		C
PCB 028	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	20		0.0714286	0.05	FALSE		8	2	E
PCB 028	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	15		0.1428571	0.05	FALSE		7	2	E
PCB 044	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	2.348461	2.13185	0.0393238	0.05	TRUE	0.1543198	4		C
PCB 049	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	12.22861	2.13185	0.0001284	0.05	TRUE	0.1164543	4		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	15		0.0039683	0.05	TRUE		8	0	E
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	42.50586	1.89458	0	0.05	TRUE	0.04992083	7		C
PCB 066	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	10.84508	2.13185	0.0002051	0.05	TRUE	0.07902224	4		C
PCB 087	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	22.96472	2.13185	1.065E-05	0.05	TRUE	0.08633319	4		C
PCB 101	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	10		0.0079365	0.05	TRUE		7	0	E
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 118	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	10.01388	2.13185	0.0002795	0.05	TRUE	0.08089788	4		C
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 138	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	10.52358	2.13185	0.0002306	0.05	TRUE	0.1203314	4		C
PCB 153	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	11.94394	2.13185	0.0001408	0.05	TRUE	0.1003101	4		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 183	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	28.5		0.6190476	0.05	FALSE		8	2	E
PCB 184	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	0.2567363	1.89458	0.4023824	0.05	FALSE	0.0184487	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	15		0.0039683	0.05	TRUE		8	0	E
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	10		0.0079365	0.05	TRUE		7	0	E
PCB 028	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	1.936735	2.13185	0.0624225	0.05	FALSE	0.4050733	4		C
PCB 044	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	1.515354	2.13185	0.1021306	0.05	FALSE	0.1744471	4		C
PCB 049	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	14.06707	2.13185	7.41E-05	0.05	TRUE	0.0878983	4		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	15		0.0039683	0.05	TRUE		8	0	E
PCB 052	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	21.86623	2.35336	0.0001047	0.05	TRUE	0.1366843	3		C
PCB 066	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	5.952734	2.13185	0.0019983	0.05	TRUE	0.1203314	4		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	10.39189	1.89458	8.3E-06	0.05	TRUE	0.05195925	7		C
PCB 087	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	9.516494	2.13185	0.0003403	0.05	TRUE	0.1330655	4		C
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 118	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	2.289286	2.13185	0.0419615	0.05	TRUE	0.1787957	4		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 138	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	6.332292	2.13185	0.0015919	0.05	TRUE	0.1663114	4		C
PCB 153	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	9.296447	2.13185	0.0003725	0.05	TRUE	0.1045692	4		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 183	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	32		0.8809524	0.05	FALSE		8	3	E
PCB 184	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.6382846	1.89458	0.7282013	0.05	FALSE	0.01632529	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 018	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	7.212317	2.13185	0.0009797	0.05	TRUE	0.3659332	4		C
PCB 028	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	18.46815	2.13185	2.529E-05	0.05	TRUE	0.06625894	4		C
PCB 044	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	3.340254	2.13185	0.0144145	0.05	TRUE	0.2361447	4		C
PCB 049	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	11.74501	2.13185	0.0001503	0.05	TRUE	0.1659009	4		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	15		0.0039683	0.05	TRUE		8	0	E
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	53.89136	1.89458	0	0.05	TRUE	0.04992083	7		C
PCB 066	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	15.20921	2.13185	5.449E-05	0.05	TRUE	0.09307165	4		C
PCB 087	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	13.33249	2.13185	9.149E-05	0.05	TRUE	0.1838834	4		C
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 118	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	13.88769	2.13185	7.794E-05	0.05	TRUE	0.1019281	4		C
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 138	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	12.29037	2.13185	0.0001259	0.05	TRUE	0.1703344	4		C
PCB 153	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	13.546	2.13185	8.595E-05	0.05	TRUE	0.1240142	4		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 180	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	27.5		0.5634921	0.05	FALSE		8	3	E
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.5469415	1.89458	0.6992944	0.05	FALSE	0.01731975	7		C
PCB 183	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	31		0.8134921	0.05	FALSE		8	3	E
PCB 184	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.171139	1.89458	0.5655218	0.05	FALSE	0.01660557	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 018	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	1.6158	2.13185	0.0907209	0.05	FALSE	0.5356665	4		C
PCB 028	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 044	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 049	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 087	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	1.593703	2.13185	0.0931128	0.05	FALSE	0.197975	4		C
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 118	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	25		0.3611111	0.05	FALSE		8	2	E
PCB 118	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	20		0.5952381	0.05	FALSE		7	2	E
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 138	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	1.677256	2.13185	0.0843988	0.05	FALSE	0.1220191	4		C
PCB 153	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	1.678564	2.13185	0.0842693	0.05	FALSE	0.1168439	4		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 183	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	29.5		0.7539682	0.05	FALSE		8	2	E
PCB 184	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.05802609	1.89458	0.4776748	0.05	FALSE	0.01632529	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	24.5		0.3214286	0.05	FALSE		8	2	E
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3007316	1.89458	0.3861774	0.05	FALSE	0.01574976	7		C
PCB 028	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 044	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 049	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 087	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 101	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	24.5		0.3214286	0.05	FALSE		8	2	E
PCB 101	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3007316	1.89458	0.3861774	0.05	FALSE	0.01574976	7		C
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 118	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	24.5		0.3214286	0.05	FALSE		8	2	E
PCB 118	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3007316	1.89458	0.3861774	0.05	FALSE	0.01574976	7		C
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 138	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	24.5		0.3214286	0.05	FALSE		8	2	E
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3007316	1.89458	0.3861774	0.05	FALSE	0.01574976	7		C
PCB 153	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	24.5		0.3214286	0.05	FALSE		8	2	E
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3007316	1.89458	0.3861774	0.05	FALSE	0.01574976	7		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 183	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	27.5		0.5793651	0.05	FALSE		8	2	E

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 184	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.8127272	1.89458	0.2215667	0.05	FALSE	0.0151524	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 1 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 15-5115-7714		Endpoint: PCB 008			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:42		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed pcb 008					140.45%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	23.5	n/a	2	8	Exact	0.2619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.68	2.29	4.7E-04	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.07744		0.07744	1	1.03	0.3406	Non-Significant Effect				
Error	0.60352		0.07544	8							
Total	0.68096			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			753	23.2	1.1E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.653	0.741	2.4E-04	Non-Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.406	-0.076	0.888	0.24	0.22	1.1	0.174	95.61%	-76.52%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	1.1	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-1119-3513		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 008				8.02%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.257	1.89	0.018	7	CDF	0.4024	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0659	0.8048	Non-Significant Effect					
Error	0.001475	0.0002107	7								
Total	0.0014889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.12	24.3	0.8771	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.866	0.701	0.1103	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	-1.09%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	Outlier	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-2806-4013		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 008				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-0482-8785		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 008				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-6856-6673		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 008			6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-7003-1131		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 008			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-9432-5804		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 018				8.02%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.257	1.89	0.018	7	CDF	0.4024	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0659	0.8048	Non-Significant Effect					
Error	0.001475	0.0002107	7								
Total	0.0014889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.12	24.3	0.8771	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.866	0.701	0.1103	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	-1.09%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	Outlier	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID:	15-5030-1590	Endpoint:	PCB 018	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:43	Analysis:	Nonparametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed pcb 018				104.07%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	10	n/a	0	7	Exact	0.0079	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.3245	4.3245	1	122	1.1E-05	Significant Effect					
Error	0.2483	0.0354714	7								
Total	4.5728		8								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			412	24.3	3.9E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.756	0.701	0.0064	Non-Normal Distribution				
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		4	1.62	1.17	2.08	1.75	1.2	1.8	0.144	17.68%	-606.52%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		1.7	1.2	1.8	Outlier	1.8					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-5946-4600	Endpoint: PCB 018		CETIS Version: CETISv1.9.3								
Analyzed: 05 Feb-19 15:43	Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 failed pcb 018			159.10%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	7.21	2.13	0.366	4	CDF	9.8E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.06	2.29	0.1767	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.83161	3.83161	1	52	9.1E-05	Significant Effect					
Error	0.58928	0.07366	8								
Total	4.42089		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		736	23.2	1.1E-05	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.894	0.741	0.1879	Normal Distribution					
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.47	0.992	1.94	1.6	0.94	1.8	0.172	26.13%	-538.26%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		1.8	0.94	1.8	1.6	1.2					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 19-6143-1880		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 018				232.90%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.62	2.13	0.536	4	CDF	0.0907	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.77	2.29	0.5441	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.41209	0.41209	1	2.61	0.1448	Non-Significant Effect					
Error	1.26272	0.15784	8								
Total	1.67481		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1580	23.2	2.4E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.846	0.741	0.0519	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.636	-0.0614	1.33	0.24	0.22	1.3	0.251	88.31%	-176.52%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		1.2	1.3	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-5643-4290		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 018				6.85%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.301	1.89	0.016	7	CDF	0.3862	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0904	0.7724	Non-Significant Effect					
Error	0.001075	0.0001536	7								
Total	0.0010889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.18	46.2	0.5476	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.701	0.0447	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		4	0.232	0.217	0.248	0.235	0.22	0.24	0.00479	4.12%	-1.09%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	Outlier	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-9341-1369		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 028	1480.94%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	20	n/a	2	8	Exact	0.0714	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.68	2.29	4.7E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9.52576	9.52576	1	1.14	0.3177	Non-Significant Effect					
Error	67.1037	8.38796	8								
Total	76.6294		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	83900	23.2	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.642	0.741	1.8E-04	Non-Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	2.18	-2.9	7.27	0.25	0.22	9.5	1.83	187.71%	-848.70%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.7	0.25	9.5	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-1289-3142		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 028	84.13%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	15	n/a	2	7	Exact	0.1429	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0333472	0.0333472	1	1.44	0.2694	Non-Significant Effect					
Error	0.162275	0.0231821	7								
Total	0.195622		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	269	24.3	9.1E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.744	0.701	0.0046	Non-Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		4	0.352	-0.0167	0.722	0.245	0.22	0.7	0.116	65.82%	-53.26%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.7	0.25	Outlier	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-8990-0680		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 028				176.12%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.94	2.13	0.405	4	CDF	0.0624	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.77	2.29	0.5448	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.33856	0.33856	1	3.75	0.0888	Non-Significant Effect					
Error	0.72208	0.09026	8								
Total	1.06064		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	902	23.2	7.4E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.886	0.741	0.1525	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.598	0.0707	1.13	0.45	0.22	1.1	0.19	71.01%	-160.00%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		1.1	1	0.45	0.22	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-8455-6280		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 028			28.81%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	18.5	2.13	0.066	4	CDF	2.5E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.64	2.29	0.8116		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.82369		0.82369	1	341	<1.0E-37	Significant Effect				
Error	0.01932		0.002415	8							
Total	0.84301			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		23.1	23.2	0.0100	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.937	0.741	0.5252	Normal Distribution					
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.804	0.72	0.888	0.81	0.73	0.88	0.0304	8.46%	-249.57%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.86	0.73	0.74	0.81	0.88					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-4966-7768		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 028			6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-7187-1647		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 028			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.286	0.6075		Non-Significant Effect			
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-1820-1441		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 failed pcb 044			67.10%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.35	2.13	0.154	4	CDF	0.0393	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.67	2.29	0.7497	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.07225		0.07225	1	5.52	0.0468	Significant Effect				
Error	0.1048		0.0131	8							
Total	0.17705			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			130	23.2	3.5E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.927	0.741	0.4182	Normal Distribution				
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.4	0.2	0.6	0.46	0.22	0.58	0.0721	40.31%	-73.91%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.58	0.46	0.5	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-9068-6664		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 044				75.85%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.52	2.13	0.174	4	CDF	0.1021	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.18	2.29	0.0975	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.03844	0.03844	1	2.3	0.1681	Non-Significant Effect					
Error	0.13392	0.01674	8								
Total	0.17236		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	166	23.2	2.1E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.877	0.741	0.1219	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.354	0.127	0.581	0.24	0.22	0.62	0.0816	51.53%	-53.91%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.47	0.24	0.62	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 20 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-3427-6458		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 failed pcb 044			102.67%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	3.34	2.13	0.236	4	CDF	0.0144	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.24	2.29	0.0686	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.34225	0.34225	1	11.2	0.0102	Significant Effect					
Error	0.2454	0.030675	8								
Total	0.58765		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	306	23.2	6.4E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.858	0.741	0.0716	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.6	0.293	0.907	0.67	0.23	0.9	0.111	41.21%	-160.87%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.68	0.67	0.23	0.52	0.9					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 21 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-8103-6882		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 044				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 22 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-1794-3809		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 044			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 23 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-9874-4482		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 failed pcb 049			50.63%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	12.2	2.13	0.116	4	CDF	1.3E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.19	2.29	0.0947	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.11556	1.11556	1	150	1.9E-06	Significant Effect					
Error	0.05968	0.00746	8								
Total	1.17524		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	73.6	23.2	0.0011	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.904	0.741	0.2440	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.898	0.747	1.05	0.94	0.72	1	0.0543	13.51%	-290.43%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		1	0.83	0.94	0.72	1					

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Report Date: 05 Feb-19 15:45 (p 24 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-6901-6953		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 failed pcb 049				38.22%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	14.1	2.13	0.088	4	CDF	7.4E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.12	2.29	0.1378	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.841	0.841	1	198	6.3E-07	Significant Effect					
Error	0.034	0.00425	8								
Total	0.875		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	41.5	23.2	0.0033	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.913	0.741	0.3021	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.81	0.697	0.923	0.82	0.68	0.92	0.0407	11.25%	-252.17%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.92	0.77	0.82	0.86	0.68					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 25 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-9965-1139		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 failed pcb 049				72.13%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	11.7	2.13	0.166	4	CDF	1.5E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.76	2.29	0.5695	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.08849	2.08849	1	138	2.5E-06	Significant Effect					
Error	0.12112	0.01514	8								
Total	2.20961		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	150	23.2	2.6E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.902	0.741	0.2312	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.14	0.929	1.36	1.2	0.94	1.3	0.0776	15.16%	-397.39%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.94	1.3	1.2	0.98	1.3					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 26 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-6328-7617		Endpoint: PCB 049		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result						PMSD	
Untransformed	C < T			31243-104 passed pcb 049						6.47%	
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 27 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-1545-6113		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 049				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-9556-5625		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 failed pcb 052				21.70%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	42.5	1.89	0.05	7	CDF	<1.0E-37	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.78756	2.78756	1	1810	<1.0E-37	Significant Effect					
Error	0.0108	0.0015429	7								
Total	2.79836		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	16.7	24.3	0.0201	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.701	0.3166	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		4	1.35	1.26	1.44	1.35	1.3	1.4	0.0289	4.28%	-486.96%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		1.4	1.3	1.3	Outlier	1.4					

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Report Date: 05 Feb-19 15:45 (p 29 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-1386-8034		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 failed pcb 052				88.71%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	15	n/a	0	8	Exact	0.0040	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.45	2.29	0.0144	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.42225	3.42225	1	114	5.2E-06	Significant Effect					
Error	0.2408	0.0301	8								
Total	3.66305		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	300	23.2	6.6E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.741	0.741	0.0028	Non-Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	1.4	1.1	1.7	1.4	1	1.6	0.11	17.50%	-508.70%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		1.6	1.4	1.6	1.4	1					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-4851-5873	Endpoint:	PCB 052	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:43	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 failed pcb 052			59.43%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	21.9	2.35	0.137	3	CDF	1.0E-04	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.58422	3.58422	1	615	<1.0E-37	Significant Effect					
Error	0.0408	0.0058286	7								
Total	3.62502		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	66.7	24.3	0.0014	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.889	0.701	0.1943	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		4	1.5	1.32	1.68	1.5	1.4	1.6	0.0577	7.70%	-552.17%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		1.6	1.4	1.6	1.4	Outlier					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-0925-7890		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 failed pcb 052			21.70%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	53.9	1.89	0.05	7	CDF	<1.0E-37	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.48089	4.48089	1	2900	<1.0E-37	Significant Effect					
Error	0.0108	0.0015429	7								
Total	4.49169		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	16.7	24.3	0.0201	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.701	0.3166	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		4	1.65	1.56	1.74	1.65	1.6	1.7	0.0289	3.50%	-617.39%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		1.6	1.7	1.6	1.7	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-0173-6432		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed pcb 052			6.47%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-8794-7343		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 052				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-3771-6910		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 failed pcb 066			34.36%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	10.8	2.13	0.079	4	CDF	2.1E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.14	2.29	0.1242		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.40401		0.40401	1	118	4.6E-06	Significant Effect				
Error	0.02748		0.003435	8							
Total	0.43149			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		33.3	23.2	0.0050		Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.932	0.741	0.4661		Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.632	0.531	0.733	0.62	0.54	0.75	0.0365	12.92%	-174.78%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.67	0.75	0.58	0.54	0.62					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-1514-2181		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 failed pcb 066			52.32%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	5.95	2.13	0.12	4	CDF	0.0020	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.42	2.29	0.0175	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.28224		0.28224	1	35.4	3.4E-04	Significant Effect				
Error	0.06372		0.007965	8							
Total	0.34596			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			78.6	23.2	9.4E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.85	0.741	0.0574	Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.566	0.41	0.722	0.51	0.46	0.77	0.0561	22.16%	-146.09%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.49	0.6	0.77	0.51	0.46					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-4770-3524		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 failed pcb 066				40.47%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	15.2	2.13	0.093	4	CDF	5.4E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.63	2.29	0.8385	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.10224	1.10224	1	231	3.5E-07	Significant Effect					
Error	0.03812	0.004765	8								
Total	1.14036		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	46.7	23.2	0.0026	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.929	0.741	0.4375	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.894	0.774	1.01	0.87	0.79	1	0.0432	10.80%	-288.70%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.79	0.99	0.82	0.87	1					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-9958-0807		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 066				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:45 (p 38 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-3938-8251		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 066			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.286	0.6075		Non-Significant Effect			
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Report Date: 05 Feb-19 15:45 (p 39 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-6724-2778		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 087				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 40 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-6833-2720		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 087				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-1248-2477	Endpoint:	PCB 087	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:43	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed pcb 087				6.57%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-1703-1319		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed pcb 087			6.47%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:45 (p 43 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-1818-5802		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 087			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.286	0.6075		Non-Significant Effect			
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Report Date: 05 Feb-19 15:45 (p 44 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-7670-8102		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 failed pcb 101	19.03%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	10	n/a	0	7	Exact	0.0079	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.78006	1.78006	1	1500	<1.0E-37	Significant Effect					
Error	0.0083	0.0011857	7								
Total	1.78836		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	12.5	24.3	0.0337	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.771	0.701	0.0095	Non-Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		4	1.13	1.05	1.2	1.1	1.1	1.2	0.025	4.44%	-389.13%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		Outlier	1.1	1.2	1.1	1.1					

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Report Date: 05 Feb-19 15:45 (p 45 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-8112-4591		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 failed pcb 101				57.85%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	9.52	2.13	0.133	4	CDF	3.4E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.19	2.29	0.0913	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.88209	0.88209	1	90.6	1.2E-05	Significant Effect					
Error	0.07792	0.00974	8								
Total	0.96001		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	96.4	23.2	6.3E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0753	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.824	0.652	0.996	0.86	0.62	1	0.0621	16.85%	-258.26%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.78	0.86	1	0.86	0.62					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-0467-3815		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 101			79.95%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	13.3	2.13	0.184	4	CDF	9.1E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.18	2.29	0.0992	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	3.30625		3.30625	1	178	9.6E-07	Significant Effect				
Error	0.1488		0.0186	8							
Total	3.45505			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			185	23.2	1.7E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.889	0.741	0.1647	Normal Distribution				
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.38	1.14	1.62	1.4	1.1	1.6	0.086	13.94%	-500.00%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		1.1	1.6	1.4	1.3	1.5					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-7169-1637		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 101				86.08%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.59	2.13	0.198	4	CDF	0.0931	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.18	2.29	0.0970	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.05476	0.05476	1	2.54	0.1497	Non-Significant Effect					
Error	0.17248	0.02156	8								
Total	0.22724		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	215	23.2	1.3E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.877	0.741	0.1207	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.378	0.121	0.635	0.24	0.22	0.68	0.0926	54.81%	-64.35%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.51	0.22	0.24	0.68					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-5164-9285		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 101			6.85%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.301	1.89	0.016	7	CDF	0.3862	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0904	0.7724	Non-Significant Effect					
Error	0.001075	0.0001536	7								
Total	0.0010889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.18	46.2	0.5476	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.701	0.0447	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		4	0.232	0.217	0.248	0.235	0.22	0.24	0.00479	4.12%	-1.09%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	Outlier	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-0801-0401		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 105				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-8325-3721		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 105				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-3788-7330		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 105				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-9547-6975		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 105				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-5793-9599		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 105			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.286	0.6075		Non-Significant Effect			
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-5081-1861		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 failed pcb 118			35.17%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	10	2.13	0.081	4	CDF	2.8E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.12	2.29	0.1335	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.361	0.361	1	100	8.4E-06	Significant Effect					
Error	0.0288	0.0036	8								
Total	0.3898		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	35	23.2	0.0045	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.929	0.741	0.4375	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.61	0.506	0.714	0.63	0.49	0.71	0.0374	13.72%	-165.22%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.71	0.63	0.65	0.49	0.57					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-6586-5248		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 failed pcb 118				77.74%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	2.29	2.13	0.179	4	CDF	0.0420	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.66	2.29	0.7593	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.09216	0.09216	1	5.24	0.0513	Non-Significant Effect					
Error	0.14068	0.017585	8								
Total	0.23284		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	175	23.2	1.9E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.904	0.741	0.2396	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.422	0.19	0.654	0.45	0.22	0.63	0.0836	44.31%	-83.48%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.57	0.24	0.63	0.45	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 56 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma **EnviroSystems, Inc.**

Analysis ID: 02-0970-2531	Endpoint: PCB 118	CETIS Version: CETISv1.9.3
Analyzed: 05 Feb-19 15:43	Analysis: Parametric-Two Sample	Official Results: Yes

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	31243-103 failed pcb 118	44.32%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed		31243-103*	13.9	2.13	0.102	4	CDF	7.8E-05	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.74	2.29	0.6042	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.10224	1.10224	1	193	7.0E-07	Significant Effect
Error	0.04572	0.005715	8			
Total	1.14796		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	56.2	23.2	0.0018	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.909	0.741	0.2769	Normal Distribution

PCB 118 Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.894	0.762	1.03	0.89	0.77	1	0.0474	11.85%	-288.70%

PCB 118 Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.24	0.24	0.21	0.22	0.24
31243-103		0.77	1	0.89	0.81	1

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-2619-4768		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 118				7.23%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	20	n/a	2	7	Exact	0.5952	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0012	0.0001714	7								
Total	0.0012		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.5	46.2	0.7698	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.751	0.701	0.0055	Non-Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		4	0.23	0.212	0.248	0.23	0.22	0.24	0.00577	5.02%	0.00%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	Outlier	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 01-0911-3673		Endpoint: PCB 118			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:44		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 118				48.47%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	24.5	n/a	2	8	Exact	0.3214	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.66	2.29	6.9E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00961	0.00961	1	1.07	0.3313	Non-Significant Effect					
Error	0.07188	0.008985	8								
Total	0.08149		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		88.8	23.2	7.4E-04	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.691	0.741	6.8E-04	Non-Normal Distribution					
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.292	0.126	0.458	0.24	0.22	0.53	0.0596	45.65%	-26.96%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.53	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-2961-3022		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 128				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-5327-5959		Endpoint: PCB 128		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed pcb 128				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-9019-9025		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 128	6.57%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Report Date: 05 Feb-19 15:45 (p 62 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-8543-9491		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 128				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 63 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-4991-4209		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 128			6.05%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-9363-1134		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 failed pcb 138			52.32%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	10.5	2.13	0.12	4	CDF	2.3E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.09	2.29	0.1546	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.88209	0.88209	1	111	5.8E-06	Significant Effect					
Error	0.06372	0.007965	8								
Total	0.94581		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	78.6	23.2	9.4E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.937	0.741	0.5248	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.824	0.668	0.98	0.79	0.69	1	0.0561	15.22%	-258.26%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.9	0.69	1	0.79	0.74					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-7735-9706		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 failed pcb 138				72.31%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	6.33	2.13	0.166	4	CDF	0.0016	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.6	2.29	0.9089	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.61009	0.61009	1	40.1	2.2E-04	Significant Effect					
Error	0.12172	0.015215	8								
Total	0.73181		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	151	23.2	2.6E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.893	0.741	0.1837	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.724	0.508	0.94	0.66	0.56	0.91	0.0778	24.01%	-214.78%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.91	0.58	0.91	0.66	0.56					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-5268-4866		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 failed pcb 138				74.06%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	12.3	2.13	0.17	4	CDF	1.3E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.12	2.29	0.1373	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.41081	2.41081	1	151	1.8E-06	Significant Effect					
Error	0.12768	0.01596	8								
Total	2.53849		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	159	23.2	2.3E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.926	0.741	0.4090	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.21	0.991	1.43	1.3	0.96	1.4	0.0796	14.69%	-426.96%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.96	1.3	1.3	1.1	1.4					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-2151-5839		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 138				53.05%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.68	2.13	0.122	4	CDF	0.0844	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.69	2.29	0.7078	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.02304	0.02304	1	2.81	0.1320	Non-Significant Effect					
Error	0.06552	0.00819	8								
Total	0.08856		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	80.9	23.2	8.9E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.885	0.741	0.1507	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.326	0.168	0.484	0.24	0.22	0.47	0.0569	39.02%	-41.74%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.47	0.22	0.24	0.46					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-5212-3470		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 138				62.94%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	24.5	n/a	2	8	Exact	0.3214	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.67	2.29	5.8E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.016	0.016	1	1.06	0.3342	Non-Significant Effect					
Error	0.1212	0.01515	8								
Total	0.1372		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	151	23.2	2.6E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.677	0.741	4.7E-04	Non-Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.31	0.0946	0.525	0.24	0.22	0.62	0.0776	55.97%	-34.78%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.62	0.22	0.24	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-0056-0249		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 138				6.85%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.301	1.89	0.016	7	CDF	0.3862	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0904	0.7724	Non-Significant Effect					
Error	0.001075	0.0001536	7								
Total	0.0010889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.18	46.2	0.5476	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.701	0.0447	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		4	0.232	0.217	0.248	0.235	0.22	0.24	0.00479	4.12%	-1.09%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	Outlier	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-7680-8230		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 failed pcb 153			43.61%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	11.9	2.13	0.1	4	CDF	1.4E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.02	2.29	0.2107	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.78961		0.78961	1	143	2.2E-06	Significant Effect				
Error	0.04428		0.005535	8							
Total	0.83389			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			54.4	23.2	0.0019	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.9	0.741	0.2218	Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.792	0.663	0.921	0.76	0.65	0.9	0.0466	13.16%	-244.35%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.9	0.76	0.89	0.65	0.76					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma **EnviroSystems, Inc.**

Analysis ID: 14-4344-3612	Endpoint: PCB 153	CETIS Version: CETISv1.9.3
Analyzed: 05 Feb-19 15:43	Analysis: Parametric-Two Sample	Official Results: Yes

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	31243-102 failed pcb 153	45.46%

Unequal Variance t Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed		31243-102*	9.3	2.13	0.105	4	CDF	3.7E-04	Significant Effect

Auxiliary Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)	
Extreme Value	Grubbs Extreme Value Test	2.13	2.29	0.1255	No Outliers Detected	

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.51984	0.51984	1	86.4	1.5E-05	Significant Effect
Error	0.04812	0.006015	8			
Total	0.56796		9			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	59.2	23.2	0.0016	Unequal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.901	0.741	0.2264	Normal Distribution	

PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.686	0.551	0.821	0.7	0.53	0.79	0.0486	15.86%	-198.26%

PCB 153 Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.24	0.24	0.21	0.22	0.24
31243-102		0.78	0.53	0.79	0.7	0.63

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-7508-5716		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed pcb 153				53.92%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	13.5	2.13	0.124	4	CDF	8.6E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1493	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1.55236		1.55236	1	183	8.5E-07	Significant Effect				
Error	0.06768		0.00846	8							
Total	1.62004			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			83.6	23.2	8.3E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.938	0.741	0.5339	Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.02	0.857	1.18	0.96	0.88	1.2	0.0578	12.70%	-342.61%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.88	1.2	0.95	0.96	1.1					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-0738-4697		Endpoint: PCB 153		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed pcb 153					50.80%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.68	2.13	0.117	4	CDF	0.0843	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.69	2.29	0.7051	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.02116		0.02116	1	2.82	0.1318	Non-Significant Effect				
Error	0.06008		0.00751	8							
Total	0.08124			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			74.1	23.2	0.0011	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.888	0.741	0.1611	Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.322	0.171	0.473	0.24	0.22	0.46	0.0544	37.81%	-40.00%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.45	0.22	0.24	0.46					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 01-7068-7934		Endpoint: PCB 153			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:44		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 153				42.06%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	24.5	n/a	2	8	Exact	0.3214	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.66	2.29	7.9E-04	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00729	0.00729	1	1.08	0.3296	Non-Significant Effect					
Error	0.05412	0.006765	8								
Total	0.06141		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			66.7	23.2	0.0013	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.699	0.741	8.7E-04	Non-Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.284	0.141	0.427	0.24	0.22	0.49	0.0516	40.65%	-23.48%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.49	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-1161-9596		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 170	7.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-3627-8230		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 170				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-1276-8387		Endpoint: PCB 170		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed pcb 170					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-9453-6606		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 170				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-3634-8794		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 170				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-0239-0617		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 180	7.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 20-1860-0580		Endpoint: PCB 180			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed pcb 180				6.47%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 14-8709-4302		Endpoint: PCB 180			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:43		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 180				62.59%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	27.5	n/a	3	8	Exact	0.5635	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.67	2.29	6.1E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01296	0.01296	1	0.865	0.3796	Non-Significant Effect					
Error	0.11988	0.014985	8								
Total	0.13284		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		149	23.2	2.7E-04	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.685	0.741	5.8E-04	Non-Normal Distribution					
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.302	0.0878	0.516	0.23	0.21	0.61	0.0772	57.13%	-31.30%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.61	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-1649-9218		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 180				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-6417-2610		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 180				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-9230-7239		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 183				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-4022-3639		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 183				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-1241-7529		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 183				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-8933-5706		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 183			6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.68	2.29	0.7304		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		1.67	23.2	0.6328		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.819	0.741	0.0249		Normal Distribution				
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-1050-5638		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 183			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-6134-3183		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 184				8.11%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	0.257	1.89	0.018	7	CDF	0.4024	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.389E-05	1.389E-05	1	0.0659	0.8048	Non-Significant Effect					
Error	0.001475	0.0002107	7								
Total	0.0014889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.12	24.3	0.8771	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.866	0.701	0.1103	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.227	0.204	0.251	0.23	0.21	0.24	0.0075	6.59%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	-1.10%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	Outlier	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-3515-6926		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 184				7.18%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.638	1.89	0.016	7	CDF	0.7282	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	6.722E-05	6.722E-05	1	0.407	0.5436	Non-Significant Effect					
Error	0.001155	0.000165	7								
Total	0.0012222		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.88	24.3	0.5495	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.932	0.701	0.4985	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.227	0.204	0.251	0.23	0.21	0.24	0.0075	6.59%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	2.42%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	Outlier	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma										EnviroSystems, Inc.	
Analysis ID: 04-3694-3199		Endpoint: PCB 184			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:43		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 184				34.17%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	31	n/a	3	8	Exact	0.8135	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.65	2.29	8.6E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00676	0.00676	1	1.04	0.3385	Non-Significant Effect					
Error	0.0522	0.006525	8								
Total	0.05896		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		99.4	23.2	5.9E-04	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.715	0.741	0.0013	Non-Normal Distribution					
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.278	0.137	0.419	0.24	0.21	0.48	0.0508	40.89%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	18.71%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.48	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-2570-8369		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 184				7.30%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.171	1.89	0.017	7	CDF	0.5655	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5E-06	5E-06	1	0.0293	0.8690	Non-Significant Effect					
Error	0.001195	0.0001707	7								
Total	0.0012		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.73	24.3	0.5968	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.895	0.701	0.2232	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.227	0.204	0.251	0.23	0.21	0.24	0.0075	6.59%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	0.66%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	Outlier	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-4112-5558		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 184	34.16%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	29.5	n/a	2	8	Exact	0.7540	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.65	2.29	8.5E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00625	0.00625	1	0.959	0.3562	Non-Significant Effect					
Error	0.05216	0.00652	8								
Total	0.05841		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	108	23.2	5.0E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.709	0.741	0.0011	Non-Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.278	0.137	0.419	0.24	0.21	0.48	0.0508	40.89%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	17.99%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.48	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-5957-8988		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 184				6.66%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.813	1.89	0.015	7	CDF	0.2216	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9.389E-05	9.389E-05	1	0.661	0.4431	Non-Significant Effect					
Error	0.000995	0.0001421	7								
Total	0.0010889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.81	24.3	0.3434	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.897	0.701	0.2367	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.227	0.204	0.251	0.23	0.21	0.24	0.0075	6.59%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-2.86%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	Outlier	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-5290-1600		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 187				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-4069-1199		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 187	6.47%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-3211-5403		Endpoint: PCB 187		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed pcb 187				6.57%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-9446-4047		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 187				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-8778-0616		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 187				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-1281-6677		Endpoint: PCB 195		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result						PMSD	
Untransformed	C < T			31243-101 passed pcb 195						7.23%	
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-6842-0056		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 195				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-0166-1825		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 195				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-4067-9679		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 195				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-1087-0723		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 195				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-5269-2630		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed pcb 206			7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.5	2.29	1.0000		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0		0	1	0	1.0000		Non-Significant Effect			
Error	0.0016		0.0002	8							
Total	0.0016			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		1	23.2	1.0000		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.859	0.741	0.0742		Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 19-5456-5449		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 206				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-8283-7491		Endpoint: PCB 206		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 206				6.57%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:45 (p 109 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-6313-4325		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 206				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 110 of 115)
 Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-5247-7608		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 206			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 111 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-8798-3621		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 209				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 112 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-5524-8741		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 209				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 113 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-7238-8844		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 209				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 114 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-8636-9116		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 209				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:46 (p 115 of 115)
Test Code: 31249Mn-PCB | 17-7443-8782

Bioaccumulation Evaluation - PCB Congeners - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-2103-6241		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:44		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 209				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

Macoma nasuta
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
Pesticides

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
Pesticides (ng/g wet weight)						
Aldrin	0.25	U	0.23	U	0.23	U
cis-Chlordane	0.25	U	0.23	U	0.23	U
trans-Chlordane	0.25	U	0.23	U	0.23	U
cis-Nonachlor	0.25	U	0.23	U	0.23	U
trans-Nonachlor	0.25	U	0.23	U	0.23	U
Oxychlordane	0.50	U	0.47	U	0.45	U
Total Chlordanes	1.5		1.4		1.4	
4,4'-DDT	0.25	U	0.23	U	0.23	U
4,4'-DDD	0.25	U	0.23	U	0.23	U
4,4'-DDE	0.25	U	0.23	U	0.23	U
Total DDT	0.74		0.70		0.68	
Dieldrin	0.25	U	0.23	U	0.23	U
alpha-Endosulfan	0.25	U	0.23	U	0.23	U
beta-Endosulfan	0.25	U	0.23	U	0.23	U
Endosulfans	0.50		0.47		0.45	
Endrin	0.25	U	0.23	U	0.23	U
Heptachlor	0.25	U	0.23	U	0.23	U
Heptachlor epoxide	0.50	U	0.47	U	0.45	U
Hexachlorobenzene	0.50	U	0.47	U	0.45	U
Lindane	0.25	U	0.23	U	0.23	U
Methoxychlor	0.99	U	0.94	U	0.91	U
Toxaphene	12	U	12	U	11	U

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
cis-Chlordane	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
trans-Chlordane	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
cis-Nonachlor	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
trans-Nonachlor	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Oxychlordane	0.49	U	0.48	U	0.43	U	0.44	U	0.49	U
Total Chlordanes	1.5		1.4		1.3		1.3		1.5	
4,4'-DDT	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
4,4'-DDD	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
4,4'-DDE	0.50		0.24	U	0.21	U	0.44		0.24	U
Total DDT	0.98		0.72		0.64		0.87		0.73	
Dieldrin	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
alpha-Endosulfan	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
beta-Endosulfan	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Endosulfans	0.49		0.48		0.43		0.44		0.49	
Endrin	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Heptachlor	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Heptachlor epoxide	0.49	U	0.48	U	0.43	U	0.44	U	0.49	U
Hexachlorobenzene	0.49	U	0.48	U	0.43	U	0.44	U	0.49	U
Lindane	0.24	U	0.24	U	0.21	U	0.22	U	0.24	U
Methoxychlor	0.98	U	0.96	U	0.86	U	0.87	U	0.98	U
Toxaphene	12	U	12	U	11	U	11	U	12	U

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
cis-Chlordane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
trans-Chlordane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
cis-Nonachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
trans-Nonachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Oxychlordane	0.44	U	0.45	U	0.49	U	1.2		0.48	U
Total Chlordanes	1.3		1.3		1.5		2.1		1.4	
4,4'-DDT	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
4,4'-DDD	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
4,4'-DDE	0.67		0.81		0.78		0.64		0.74	
Total DDT	1.1		1.3		1.3		1.1		1.2	
Dieldrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
alpha-Endosulfan	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
beta-Endosulfan	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Endosulfans	0.44		0.45		0.49		0.44		0.48	
Endrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Heptachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Heptachlor epoxide	0.44	U	0.45	U	0.49	U	0.44	U	0.48	U
Hexachlorobenzene	0.44	U	0.45	U	0.49	U	0.44	U	0.48	U
Lindane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Methoxychlor	0.89	U	0.90	U	0.98	U	0.88	U	0.97	U
Toxaphene	11	U	11	U	12	U	11	U	12	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
cis-Chlordane	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
trans-Chlordane	1.8		2.3		2.2		2.1		2.0	
cis-Nonachlor	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
trans-Nonachlor	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Oxychlordane	0.43	U	0.47	U	0.44	U	1.0		0.44	U
Total Chlordanes	2.9		3.4		3.3		3.8		3.1	
4,4'-DDT	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
4,4'-DDD	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
4,4'-DDE	0.61		0.60		0.80		0.83		0.64	
Total DDT	1.0		1.1		1.2		1.3		1.1	
Dieldrin	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
alpha-Endosulfan	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
beta-Endosulfan	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Endosulfans	0.43		0.47		0.44		0.45		0.44	
Endrin	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Heptachlor	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Heptachlor epoxide	0.43	U	0.47	U	0.44	U	0.45	U	0.44	U
Hexachlorobenzene	0.43	U	0.47	U	0.44	U	0.45	U	0.44	U
Lindane	0.21	U	0.24	U	0.22	U	0.22	U	0.22	U
Methoxychlor	0.85	U	0.94	U	0.88	U	0.89	U	0.89	U
Toxaphene	11	U	12	U	11	U	11	U	11	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
cis-Chlordane	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
trans-Chlordane	1.3		1.5		1.5		1.4		1.6	
cis-Nonachlor	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
trans-Nonachlor	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Oxychlordane	0.48	U	0.42	U	0.46	U	0.46	U	0.44	U
Total Chlordanes	2.5		2.6		2.6		2.5		2.7	
4,4'-DDT	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
4,4'-DDD	0.24	U	0.47		0.23	U	0.23	U	0.22	U
4,4'-DDE	0.81		1.0		0.82		0.91		0.97	
Total DDT	1.3		1.7		1.3		1.4		1.4	
Dieldrin	0.24	U	0.47		0.23	U	0.23	U	0.22	U
alpha-Endosulfan	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
beta-Endosulfan	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Endosulfans	0.48		0.42		0.47		0.46		0.44	
Endrin	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Heptachlor	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Heptachlor epoxide	0.48	U	0.42	U	0.46	U	0.46	U	0.44	U
Hexachlorobenzene	0.48	U	0.42	U	0.46	U	0.46	U	0.44	U
Lindane	0.24	U	0.21	U	0.23	U	0.23	U	0.22	U
Methoxychlor	0.96	U	0.85	U	0.93	U	0.93	U	0.89	U
Toxaphene	12	U	11	U	12	U	12	U	11	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
cis-Chlordane	0.24	U	0.58		0.22	U	0.24	U	0.22	U
trans-Chlordane	0.59		2.1		1.0		0.24	U	1.2	
cis-Nonachlor	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
trans-Nonachlor	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Oxychlordane	0.49	U	0.45	U	0.43	U	0.48	U	0.44	U
Total Chlordanes	1.8		3.5		2.1		1.4		2.3	
4,4'-DDT	0.24	U	0.53		0.22	U	0.24	U	0.22	U
4,4'-DDD	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
4,4'-DDE	0.24	U	0.53		0.51		0.24	U	0.22	U
Total DDT	0.73		1.3		0.94		0.72		0.66	
Dieldrin	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
alpha-Endosulfan	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
beta-Endosulfan	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Endosulfans	0.49		0.45		0.43		0.48		0.44	
Endrin	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Heptachlor	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Heptachlor epoxide	0.49	U	0.45	U	0.43	U	0.48	U	0.44	U
Hexachlorobenzene	0.49	U	0.45	U	0.43	U	0.48	U	0.44	U
Lindane	0.24	U	0.22	U	0.22	U	0.24	U	0.22	U
Methoxychlor	0.97	U	0.89	U	0.87	U	0.97	U	0.89	U
Toxaphene	12	U	11	U	11	U	12	U	11	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
cis-Chlordane	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
trans-Chlordane	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
cis-Nonachlor	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
trans-Nonachlor	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Oxychlordane	0.49	U	0.49	U	0.44	U	0.48	U	0.45	U
Total Chlordanes	1.5		1.5		1.3		1.4		1.4	
4,4'-DDT	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
4,4'-DDD	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
4,4'-DDE	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Total DDT	0.73		0.73		0.67		0.72		0.68	
Dieldrin	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
alpha-Endosulfan	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
beta-Endosulfan	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Endosulfans	0.49		0.49		0.44		0.48		0.45	
Endrin	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Heptachlor	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Heptachlor epoxide	0.49	U	0.49	U	0.44	U	0.48	U	0.45	U
Hexachlorobenzene	0.49	U	0.49	U	0.44	U	0.48	U	0.45	U
Lindane	0.24	U	0.24	U	0.22	U	0.24	U	0.23	U
Methoxychlor	0.97	U	0.98	U	0.89	U	0.96	U	0.91	U
Toxaphene	12	U	12	U	11	U	12	U	11	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:10 (p 1 of 2)

Test Code/ID: 00-8972-9558/31249Mn-Pest

Bioaccumulation Evaluation - Pesticides - Macoma **EnviroSystems, Inc.**

Start Date: 21 Nov-18 12:04 **Species:** Macoma nasuta **Sample Code:** 31249-000
End Date: 19 Dec-18 12:04 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 21 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Mn)

Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha chlordane	alpha-BHC	beta-BHC	cis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlordane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs	
31242-008	1	2	0.24	0.5	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.98	0.49	12	0.24							
31242-008	2	7	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.96	0.48	12	0.24							
31242-008	3	13	0.21	0.21	0.21	0.21	0.21			0.21		0.21	0.21	0.21	0.21	0.21	0.21	0.43	0.43	0.86	0.43	11	0.21							
31242-008	4	20	0.22	0.44	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.87	0.44	11	0.22							
31242-008	5	28	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.98	0.49	12	0.24							
31243-101	1	4	0.22	0.67	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.89	0.44	11	0.22							
31243-101	2	12	0.22	0.81	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.45	0.45	0.9	0.45	11	0.22							
31243-101	3	15	0.25	0.78	0.25	0.25	0.25			0.25		0.25	0.25	0.25	0.25	0.25	0.25	0.49	0.49	0.98	0.49	12	0.25							
31243-101	4	24	0.22	0.64	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.88	1.2	11	0.22							
31243-101	5	29	0.24	0.74	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.97	0.48	12	0.24							
31243-102	1	1	0.21	0.61	0.21	0.21	0.21			0.21		0.21	0.21	0.21	0.21	0.21	1.8	0.21	0.43	0.43	0.85	0.43	11	0.21						
31243-102	2	10	0.24	0.6	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	2.3	0.24	0.47	0.47	0.94	0.47	12	0.24						
31243-102	3	18	0.22	0.8	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	2.2	0.22	0.44	0.44	0.88	0.44	11	0.22						
31243-102	4	23	0.22	0.83	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	2.1	0.22	0.45	0.45	0.89	1	11	0.22						
31243-102	5	30	0.22	0.64	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	2	0.22	0.44	0.44	0.89	0.44	11	0.22						
31243-103	1	6	0.24	0.81	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	1.3	0.24	0.48	0.48	0.96	0.48	12	0.24						
31243-103	2	11	0.47	1.03	0.21	0.21	0.21			0.21		0.47	0.21	0.21	0.21	0.21	1.5	0.21	0.42	0.42	0.85	0.42	11	0.21						
31243-103	3	14	0.23	0.82	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	1.5	0.23	0.46	0.46	0.93	0.46	12	0.23						
31243-103	4	22	0.23	0.91	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	1.4	0.23	0.46	0.46	0.93	0.46	12	0.23						
31243-103	5	27	0.22	0.97	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	1.6	0.22	0.44	0.44	0.89	0.44	11	0.22						
31243-104	1	5	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.59	0.24	0.49	0.49	0.97	0.49	12	0.24						
31243-104	2	9	0.22	0.53	0.53	0.22	0.58			0.22		0.22	0.22	0.22	0.22	0.22	2.1	0.22	0.45	0.45	0.89	0.45	11	0.22						
31243-104	3	16	0.22	0.51	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	1	0.22	0.43	0.43	0.87	0.43	11	0.22						
31243-104	4	21	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.97	0.48	12	0.24							
31243-104	5	26	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	1.2	0.22	0.44	0.44	0.89	0.44	11	0.22						
31243-105	1	3	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.97	0.49	12	0.24							
31243-105	2	8	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.98	0.49	12	0.24							
31243-105	3	17	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.89	0.44	11	0.22							
31243-105	4	19	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.96	0.48	12	0.24							

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:10 (p 2 of 2)

Test Code/ID: 00-8972-9558/31249Mn-Pest

Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha-chlordane	alpha-BHC	beta-BHC	dis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlordane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs
31243-105	5	25	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.45	0.45	0.91	0.45	11	0.23					

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 1 of 11)
 Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma	EnviroSystems, Inc.
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Batch ID: 19-3262-0177	Test Type: Bioaccumulation - Pesticides	Analyst: Nancy Roka
Start Date: 21 Nov-18 12:04	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 19 Dec-18 12:04	Species: Macoma nasuta	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
10-7918-4970	4-4'-DDD	Equal Variance t Two-Sample Test	0.5000	31243-101 passed 4-4'-ddd
12-5676-4839	4-4'-DDD	Equal Variance t Two-Sample Test	0.8267	31243-102 passed 4-4'-ddd
15-9233-1535	4-4'-DDD	Equal Variance t Two-Sample Test	0.5000	31243-103 passed 4-4'-ddd
11-3902-4308	4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	0.4048	31243-103 passed 4-4'-ddd
04-0339-0697	4-4'-DDD	Equal Variance t Two-Sample Test	0.5956	31243-104 passed 4-4'-ddd
18-1725-8052	4-4'-DDD	Equal Variance t Two-Sample Test	0.3038	31243-105 passed 4-4'-ddd
18-7626-3223	4-4'-DDE	Equal Variance t Two-Sample Test	1.8E-04	31243-101 failed 4-4'-dde
03-2845-4360	4-4'-DDE	Equal Variance t Two-Sample Test	7.0E-04	31243-102 failed 4-4'-dde
10-4310-6027	4-4'-DDE	Equal Variance t Two-Sample Test	2.3E-05	31243-103 failed 4-4'-dde
15-9191-3395	4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-104 passed 4-4'-dde
09-6038-0996	4-4'-DDE	Unequal Variance t Two-Sample Test	0.9002	31243-105 passed 4-4'-dde
09-2679-5973	4-4'-DDT	Equal Variance t Two-Sample Test	0.5000	31243-101 passed 4-4'-ddt
15-0027-9913	4-4'-DDT	Equal Variance t Two-Sample Test	0.8267	31243-102 passed 4-4'-ddt
09-4568-9081	4-4'-DDT	Equal Variance t Two-Sample Test	0.6822	31243-103 passed 4-4'-ddt
09-9430-2453	4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	0.3611	31243-104 passed 4-4'-ddt
14-3079-8205	4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	0.5952	31243-104 passed 4-4'-ddt
13-5563-3973	4-4'-DDT	Equal Variance t Two-Sample Test	0.3038	31243-105 passed 4-4'-ddt
10-5890-1541	aldrin	Equal Variance t Two-Sample Test	0.5000	31243-101 passed aldrin
15-2346-9392	aldrin	Equal Variance t Two-Sample Test	0.8267	31243-102 passed aldrin
18-8883-4371	aldrin	Equal Variance t Two-Sample Test	0.6822	31243-103 passed aldrin
20-0260-6456	aldrin	Equal Variance t Two-Sample Test	0.5956	31243-104 passed aldrin
09-1069-6462	aldrin	Equal Variance t Two-Sample Test	0.3038	31243-105 passed aldrin
12-6563-3317	alpha chlordane	Equal Variance t Two-Sample Test	0.5000	31243-101 passed alpha chlordane
12-2677-4331	alpha chlordane	Equal Variance t Two-Sample Test	0.8267	31243-102 passed alpha chlordane
13-8929-1900	alpha chlordane	Equal Variance t Two-Sample Test	0.6822	31243-103 passed alpha chlordane
09-9634-4136	alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	0.5952	31243-104 passed alpha chlordane
20-4027-5678	alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	0.3611	31243-104 passed alpha chlordane
04-5534-0272	alpha chlordane	Equal Variance t Two-Sample Test	0.3038	31243-105 passed alpha chlordane
13-6008-2815	cis-Nonachlor	Equal Variance t Two-Sample Test	0.5000	31243-101 passed cis-nonachlor
19-7473-6332	cis-Nonachlor	Equal Variance t Two-Sample Test	0.8267	31243-102 passed cis-nonachlor
20-9424-6754	cis-Nonachlor	Equal Variance t Two-Sample Test	0.6822	31243-103 passed cis-nonachlor
08-2697-3040	cis-Nonachlor	Equal Variance t Two-Sample Test	0.5956	31243-104 passed cis-nonachlor
19-4586-0893	cis-Nonachlor	Equal Variance t Two-Sample Test	0.3038	31243-105 passed cis-nonachlor

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 2 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
14-6611-2758	Dieldrin	Equal Variance t Two-Sample Test	0.5000	31243-101 passed dieldrin
09-4399-5028	Dieldrin	Equal Variance t Two-Sample Test	0.8267	31243-102 passed dieldrin
07-1472-0407	Dieldrin	Equal Variance t Two-Sample Test	0.5000	31243-103 passed dieldrin
18-0185-2594	Dieldrin	Wilcoxon Rank Sum Two-Sample Test	0.4048	31243-103 passed dieldrin
09-4172-8521	Dieldrin	Equal Variance t Two-Sample Test	0.5956	31243-104 passed dieldrin
19-5697-6840	Dieldrin	Equal Variance t Two-Sample Test	0.3038	31243-105 passed dieldrin
21-1064-8156	endosulfan I	Equal Variance t Two-Sample Test	0.5000	31243-101 passed endosulfan i
00-0781-2533	endosulfan I	Equal Variance t Two-Sample Test	0.8267	31243-102 passed endosulfan i
09-9770-4534	endosulfan I	Equal Variance t Two-Sample Test	0.6822	31243-103 passed endosulfan i
06-2801-9638	endosulfan I	Equal Variance t Two-Sample Test	0.5956	31243-104 passed endosulfan i
04-5916-7807	endosulfan I	Equal Variance t Two-Sample Test	0.3038	31243-105 passed endosulfan i
17-4316-6277	endosulfan II	Equal Variance t Two-Sample Test	0.5000	31243-101 passed endosulfan ii
07-9022-4840	endosulfan II	Equal Variance t Two-Sample Test	0.8267	31243-102 passed endosulfan ii
14-9154-8130	endosulfan II	Equal Variance t Two-Sample Test	0.6822	31243-103 passed endosulfan ii
10-3282-9056	endosulfan II	Equal Variance t Two-Sample Test	0.5956	31243-104 passed endosulfan ii
20-9731-1311	endosulfan II	Equal Variance t Two-Sample Test	0.3038	31243-105 passed endosulfan ii
11-9026-3117	endrin	Equal Variance t Two-Sample Test	0.5000	31243-101 passed endrin
05-4221-9451	endrin	Equal Variance t Two-Sample Test	0.8267	31243-102 passed endrin
19-5460-0053	endrin	Equal Variance t Two-Sample Test	0.6822	31243-103 passed endrin
21-1859-3737	endrin	Equal Variance t Two-Sample Test	0.5956	31243-104 passed endrin
01-4555-4935	endrin	Equal Variance t Two-Sample Test	0.3038	31243-105 passed endrin
03-0725-1606	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.5000	31243-101 passed gamma-bhc (lindane)
15-4372-8732	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.8267	31243-102 passed gamma-bhc (lindane)
07-1343-1487	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.6822	31243-103 passed gamma-bhc (lindane)
12-3950-2973	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.5956	31243-104 passed gamma-bhc (lindane)
10-1207-7613	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.3038	31243-105 passed gamma-bhc (lindane)
13-2080-0006	gamma-chlordane	Equal Variance t Two-Sample Test	0.5000	31243-101 passed gamma-chlordane
05-7624-2648	gamma-chlordane	Unequal Variance t Two-Sample Test	1.4E-05	31243-102 failed gamma-chlordane
02-6843-2915	gamma-chlordane	Unequal Variance t Two-Sample Test	9.0E-06	31243-103 failed gamma-chlordane
07-5584-2949	gamma-chlordane	Unequal Variance t Two-Sample Test	0.0326	31243-104 failed gamma-chlordane
16-3389-7020	gamma-chlordane	Equal Variance t Two-Sample Test	0.3038	31243-105 passed gamma-chlordane
21-1171-5849	heptachlor	Equal Variance t Two-Sample Test	0.5000	31243-101 passed heptachlor
17-1415-0550	heptachlor	Equal Variance t Two-Sample Test	0.8267	31243-102 passed heptachlor
19-4755-2897	heptachlor	Equal Variance t Two-Sample Test	0.6822	31243-103 passed heptachlor
11-2526-2340	heptachlor	Equal Variance t Two-Sample Test	0.5956	31243-104 passed heptachlor
18-2225-4717	heptachlor	Equal Variance t Two-Sample Test	0.3038	31243-105 passed heptachlor
18-9387-0911	heptachlor epoxide	Equal Variance t Two-Sample Test	0.6363	31243-101 passed heptachlor epoxide
13-5196-9210	heptachlor epoxide	Equal Variance t Two-Sample Test	0.8966	31243-102 passed heptachlor epoxide
18-7463-8797	heptachlor epoxide	Equal Variance t Two-Sample Test	0.7905	31243-103 passed heptachlor epoxide
20-0177-5320	heptachlor epoxide	Equal Variance t Two-Sample Test	0.6718	31243-104 passed heptachlor epoxide
13-9494-3720	heptachlor epoxide	Equal Variance t Two-Sample Test	0.4079	31243-105 passed heptachlor epoxide
21-1978-5423	hexachlorobenzene	Equal Variance t Two-Sample Test	0.6363	31243-101 passed hexachlorobenzene
18-3082-0549	hexachlorobenzene	Equal Variance t Two-Sample Test	0.8966	31243-102 passed hexachlorobenzene
01-7834-5061	hexachlorobenzene	Equal Variance t Two-Sample Test	0.7905	31243-103 passed hexachlorobenzene
10-0999-1594	hexachlorobenzene	Equal Variance t Two-Sample Test	0.6718	31243-104 passed hexachlorobenzene
20-1001-3399	hexachlorobenzene	Equal Variance t Two-Sample Test	0.4079	31243-105 passed hexachlorobenzene
04-9035-9936	Methoxychlor	Equal Variance t Two-Sample Test	0.5676	31243-101 passed methoxychlor
17-7413-4406	Methoxychlor	Equal Variance t Two-Sample Test	0.8870	31243-102 passed methoxychlor
07-2085-5391	Methoxychlor	Equal Variance t Two-Sample Test	0.7003	31243-103 passed methoxychlor
17-0283-6331	Methoxychlor	Equal Variance t Two-Sample Test	0.6319	31243-104 passed methoxychlor
06-6016-5571	Methoxychlor	Equal Variance t Two-Sample Test	0.3594	31243-105 passed methoxychlor
00-8542-5518	oxychlordan	Equal Variance t Two-Sample Test	0.5214	31243-101 passed oxychlordan
16-5309-1950	oxychlordan	Wilcoxon Rank Sum Two-Sample Test	0.3294	31243-101 passed oxychlordan

CETIS Summary Report

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
20-6177-0348	oxychlordane	Equal Variance t Two-Sample Test	0.8785	31243-102 passed oxychlordane
20-1695-8795	oxychlordane	Wilcoxon Rank Sum Two-Sample Test	0.6706	31243-102 passed oxychlordane
15-7678-9530	oxychlordane	Equal Variance t Two-Sample Test	0.7905	31243-103 passed oxychlordane
17-2081-6672	oxychlordane	Equal Variance t Two-Sample Test	0.6718	31243-104 passed oxychlordane
11-7788-5162	oxychlordane	Equal Variance t Two-Sample Test	0.4079	31243-105 passed oxychlordane
12-2441-4271	toxaphene	Equal Variance t Two-Sample Test	0.7102	31243-101 passed toxaphene
05-7163-2231	toxaphene	Equal Variance t Two-Sample Test	0.8792	31243-102 passed toxaphene
07-6884-9096	toxaphene	Wilcoxon Rank Sum Two-Sample Test	0.7381	31243-103 passed toxaphene
11-1161-8841	toxaphene	Equal Variance t Two-Sample Test	0.7102	31243-104 passed toxaphene
14-8164-0987	toxaphene	Wilcoxon Rank Sum Two-Sample Test	0.7381	31243-105 passed toxaphene
17-3809-4452	trans-nonachlor	Equal Variance t Two-Sample Test	0.5000	31243-101 passed trans-nonachlor
14-5550-0612	trans-nonachlor	Equal Variance t Two-Sample Test	0.8267	31243-102 passed trans-nonachlor
09-1382-8135	trans-nonachlor	Equal Variance t Two-Sample Test	0.6822	31243-103 passed trans-nonachlor
19-6979-3914	trans-nonachlor	Equal Variance t Two-Sample Test	0.5956	31243-104 passed trans-nonachlor
17-5794-1762	trans-nonachlor	Equal Variance t Two-Sample Test	0.3038	31243-105 passed trans-nonachlor

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 4 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma											EnviroSystems, Inc.
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.278	0.144	0.412	0.22	0.47	0.0481	0.108	38.69%	-20.87%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.21	0.5	0.0598	0.134	41.02%	0.00%
31243-101		5	0.728	0.639	0.817	0.64	0.81	0.0322	0.0719	9.88%	-123.31%
31243-102		5	0.696	0.559	0.833	0.6	0.83	0.0493	0.11	15.82%	-113.50%
31243-103		5	0.908	0.79	1.03	0.81	1.03	0.0425	0.095	10.46%	-178.53%
31243-104		5	0.348	0.153	0.543	0.22	0.53	0.0704	0.157	45.23%	-6.75%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	28.22%
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.29	0.123	0.457	0.22	0.53	0.0602	0.135	46.39%	-26.09%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.3	0.105	0.495	0.22	0.58	0.0701	0.157	52.28%	-30.43%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 5 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma											EnviroSystems, Inc.
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.278	0.144	0.412	0.22	0.47	0.0481	0.108	38.69%	-20.87%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	2.08	1.84	2.32	1.8	2.3	0.086	0.192	9.25%	-804.35%
31243-103		5	1.46	1.32	1.6	1.3	1.6	0.051	0.114	7.81%	-534.78%
31243-104		5	1.03	0.15	1.9	0.24	2.1	0.316	0.706	68.79%	-346.09%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma											EnviroSystems, Inc.
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.43	0.49	0.0129	0.0288	6.18%	0.00%
31243-101		5	0.46	0.431	0.489	0.44	0.49	0.0105	0.0235	5.10%	1.29%
31243-102		5	0.446	0.427	0.465	0.43	0.47	0.00678	0.0152	3.40%	4.29%
31243-103		5	0.452	0.424	0.48	0.42	0.48	0.0102	0.0228	5.05%	3.00%
31243-104		5	0.458	0.426	0.49	0.43	0.49	0.0116	0.0259	5.65%	1.72%
31243-105		5	0.47	0.441	0.499	0.44	0.49	0.0105	0.0235	4.99%	-0.86%
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.43	0.49	0.0129	0.0288	6.18%	0.00%
31243-101		5	0.46	0.431	0.489	0.44	0.49	0.0105	0.0235	5.10%	1.29%
31243-102		5	0.446	0.427	0.465	0.43	0.47	0.00678	0.0152	3.40%	4.29%
31243-103		5	0.452	0.424	0.48	0.42	0.48	0.0102	0.0228	5.05%	3.00%
31243-104		5	0.458	0.426	0.49	0.43	0.49	0.0116	0.0259	5.65%	1.72%
31243-105		5	0.47	0.441	0.499	0.44	0.49	0.0105	0.0235	4.99%	-0.86%
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.86	0.98	0.0268	0.06	6.45%	0.00%
31243-101		5	0.924	0.865	0.983	0.88	0.98	0.0211	0.0472	5.11%	0.65%
31243-102		5	0.89	0.85	0.93	0.85	0.94	0.0145	0.0324	3.64%	4.30%
31243-103		5	0.912	0.859	0.965	0.85	0.96	0.0191	0.0427	4.68%	1.94%
31243-104		5	0.918	0.858	0.978	0.87	0.97	0.0215	0.0482	5.25%	1.29%
31243-105		5	0.942	0.893	0.991	0.89	0.98	0.0177	0.0396	4.21%	-1.29%
oxychlorodane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.43	0.49	0.0129	0.0288	6.18%	0.00%
31243-101		5	0.612	0.203	1.02	0.44	1.2	0.147	0.329	53.82%	-31.33%
31243-102		5	0.556	0.247	0.865	0.43	1	0.111	0.249	44.72%	-19.31%
31243-103		5	0.452	0.424	0.48	0.42	0.48	0.0102	0.0228	5.05%	3.00%
31243-104		5	0.458	0.426	0.49	0.43	0.49	0.0116	0.0259	5.65%	1.72%
31243-105		5	0.47	0.441	0.499	0.44	0.49	0.0105	0.0235	4.99%	-0.86%
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	11	12	0.245	0.548	4.72%	0.00%
31243-101		5	11.4	10.7	12.1	11	12	0.245	0.548	4.80%	1.72%
31243-102		5	11.2	10.6	11.8	11	12	0.2	0.447	3.99%	3.45%
31243-103		5	11.6	10.9	12.3	11	12	0.245	0.548	4.72%	0.00%
31243-104		5	11.4	10.7	12.1	11	12	0.245	0.548	4.80%	1.72%
31243-105		5	11.6	10.9	12.3	11	12	0.245	0.548	4.72%	0.00%

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma											EnviroSystems, Inc.
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.21	0.24	0.00632	0.0141	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.21	0.24	0.0049	0.011	4.93%	3.48%
31243-103		5	0.226	0.212	0.24	0.21	0.24	0.0051	0.0114	5.05%	1.74%
31243-104		5	0.228	0.214	0.242	0.22	0.24	0.0049	0.011	4.80%	0.87%
31243-105		5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	-1.74%

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 8 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.
4-4'-DDD Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.47	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
4-4'-DDE Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.5	0.24	0.21	0.44	0.24	
31243-101		0.67	0.81	0.78	0.64	0.74	
31243-102		0.61	0.6	0.8	0.83	0.64	
31243-103		0.81	1.03	0.82	0.91	0.97	
31243-104		0.24	0.53	0.51	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
4-4'-DDT Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.53	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
aldrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
alpha chlordane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.58	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
cis-Nonachlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.
Dieldrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.47	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
endosulfan I Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
endosulfan II Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
endrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
gamma-BHC (Lindane) Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
gamma-chlordane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		1.8	2.3	2.2	2.1	2	
31243-103		1.3	1.5	1.5	1.4	1.6	
31243-104		0.59	2.1	1	0.24	1.2	
31243-105		0.24	0.24	0.22	0.24	0.23	

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 10 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.
heptachlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.24	0.24	0.21	0.22	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.21	0.24	0.22	0.22	0.22	
31243-103		0.24	0.21	0.23	0.23	0.22	
31243-104		0.24	0.22	0.22	0.24	0.22	
31243-105		0.24	0.24	0.22	0.24	0.23	
heptachlor epoxide Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.49	0.48	0.43	0.44	0.49	
31243-101		0.44	0.45	0.49	0.44	0.48	
31243-102		0.43	0.47	0.44	0.45	0.44	
31243-103		0.48	0.42	0.46	0.46	0.44	
31243-104		0.49	0.45	0.43	0.48	0.44	
31243-105		0.49	0.49	0.44	0.48	0.45	
hexachlorobenzene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.49	0.48	0.43	0.44	0.49	
31243-101		0.44	0.45	0.49	0.44	0.48	
31243-102		0.43	0.47	0.44	0.45	0.44	
31243-103		0.48	0.42	0.46	0.46	0.44	
31243-104		0.49	0.45	0.43	0.48	0.44	
31243-105		0.49	0.49	0.44	0.48	0.45	
Methoxychlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.98	0.96	0.86	0.87	0.98	
31243-101		0.89	0.9	0.98	0.88	0.97	
31243-102		0.85	0.94	0.88	0.89	0.89	
31243-103		0.96	0.85	0.93	0.93	0.89	
31243-104		0.97	0.89	0.87	0.97	0.89	
31243-105		0.97	0.98	0.89	0.96	0.91	
oxychlorodane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.49	0.48	0.43	0.44	0.49	
31243-101		0.44	0.45	0.49	1.2	0.48	
31243-102		0.43	0.47	0.44	1	0.44	
31243-103		0.48	0.42	0.46	0.46	0.44	
31243-104		0.49	0.45	0.43	0.48	0.44	
31243-105		0.49	0.49	0.44	0.48	0.45	
toxaphene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	12	12	11	11	12	
31243-101		11	11	12	11	12	
31243-102		11	12	11	11	11	
31243-103		12	11	12	12	11	
31243-104		12	11	11	12	11	
31243-105		12	12	11	12	11	

CETIS Summary Report

Report Date: 05 Feb-19 15:51 (p 11 of 11)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma						EnviroSystems, Inc.
trans-nonachlor Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.24	0.24	0.21	0.22	0.24
31243-101		0.22	0.22	0.25	0.22	0.24
31243-102		0.21	0.24	0.22	0.22	0.22
31243-103		0.24	0.21	0.23	0.23	0.22
31243-104		0.24	0.22	0.22	0.24	0.22
31243-105		0.24	0.24	0.22	0.24	0.23

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	5.920734	1.85955	0.0001767	0.05	TRUE	0.1262577	8		C
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
gamma-chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.3611579	1.85955	0.6363335	0.05	FALSE	0.03089313	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.3611579	1.85955	0.6363335	0.05	FALSE	0.03089313	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1757124	1.85955	0.5675569	0.05	FALSE	0.06349751	8		C
oxychlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	25		0.3293651	0.05	FALSE		8	4	E
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.0556665	1.89458	0.5214185	0.05	FALSE	0.03403469	7		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5773503	1.85955	0.710208	0.05	FALSE	0.6441664	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.332E-07	1.85955	0.4999999	0.05	FALSE	0.0166323	8		C
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	4.775884	1.85955	0.000699	0.05	TRUE	0.144064	8		C
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
gamma-chlordane	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	21.44792	2.13185	1.397E-05	0.05	TRUE	0.1838834	4		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.373606	1.85955	0.896589	0.05	FALSE	0.02707543	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.373606	1.85955	0.896589	0.05	FALSE	0.02707543	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.311652	1.85955	0.8869869	0.05	FALSE	0.05670859	8		C
oxychlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	29.5		0.6706349	0.05	FALSE		8	2	E
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.274987	1.89458	0.8785006	0.05	FALSE	0.03120514	7		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.264911	1.85955	0.879248	0.05	FALSE	0.5880407	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.9999998	1.85955	0.8267032	0.05	FALSE	0.01487638	8		C
4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	26		0.4047619	0.05	FALSE		8	2	E
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	6.5048E-07	1.89458	0.4999998	0.05	FALSE	0.01519042	7		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	7.934724	1.85955	2.316E-05	0.05	TRUE	0.136395	8		C
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
Dieldrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	26		0.4047619	0.05	FALSE		8	2	E
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	6.5048E-07	1.89458	0.4999998	0.05	FALSE	0.01519042	7		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
gamma-chlordane	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	23.93884	2.13185	9.03E-06	0.05	TRUE	0.1095363	4		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.8520131	1.85955	0.7905098	0.05	FALSE	0.03055549	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.8520131	1.85955	0.7905098	0.05	FALSE	0.03055549	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.5467113	1.85955	0.700255	0.05	FALSE	0.06122404	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.8520131	1.85955	0.7905098	0.05	FALSE	0.03055549	8		C
toxaphene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	27.5		0.7380952	0.05	FALSE		8	2	E
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4923655	1.85955	0.6821561	0.05	FALSE	0.01510704	8		C
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	25		0.3214286	0.05	FALSE		8	1	E
4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	25		0.3611111	0.05	FALSE		8	2	E
4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	20		0.5952381	0.05	FALSE		7	2	E
aldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	25		0.3611111	0.05	FALSE		8	2	E
alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	20		0.5952381	0.05	FALSE		7	2	E
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
gamma-chlordane	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	2.521514	2.13185	0.0326257	0.05	TRUE	0.6729886	4		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.4618804	1.85955	0.6717662	0.05	FALSE	0.03220832	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.4618804	1.85955	0.6717662	0.05	FALSE	0.03220832	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.3487429	1.85955	0.6318586	0.05	FALSE	0.06398576	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.4618804	1.85955	0.6717662	0.05	FALSE	0.03220832	8		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.5773503	1.85955	0.710208	0.05	FALSE	0.6441664	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.01487638	8		C
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
4-4'-DDE	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	-1.53504	2.13185	0.9002162	0.05	FALSE	0.1277686	4		C

STUDY: 31249
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
gamma-chlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.2407714	1.85955	0.407894	0.05	FALSE	0.03089314	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.2407714	1.85955	0.407894	0.05	FALSE	0.03089314	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.3731822	1.85955	0.3593536	0.05	FALSE	0.05979539	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.2407714	1.85955	0.407894	0.05	FALSE	0.03089314	8		C
toxaphene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	27.5		0.7380952	0.05	FALSE		8	2	E
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5345228	1.85955	0.3037555	0.05	FALSE	0.01391558	8		C

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 1 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-7918-4970		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed 4-4'-ddd				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 2 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-5676-4839		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed 4-4'-ddd				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 3 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-9233-1535		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed 4-4'-ddd				6.60%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	6.5E-07	1.89	0.015	7	CDF	0.5000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.551E-17	5.551E-17	1	3.89E-13	1.0000	Non-Significant Effect					
Error	0.001	0.0001429	7								
Total	0.001		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3	46.2	0.3935	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.844	0.701	0.0648	Normal Distribution						
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		4	0.23	0.217	0.243	0.23	0.22	0.24	0.00408	3.55%	0.00%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	Outlier	0.23	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-0339-0697		Endpoint: 4-4'-DDD			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed 4-4'-ddd				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	18-1725-8052	Endpoint:	4-4'-DDD	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:49	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed 4-4'-ddd				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-7626-3223		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 failed 4-4'-dde				38.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	5.92	1.86	0.126	8	CDF	1.8E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.72	2.29	0.6440	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.40401	0.40401	1	35.1	3.5E-04	Significant Effect					
Error	0.0922	0.011525	8								
Total	0.49621		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.46	23.2	0.2567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.903	0.741	0.2381	Normal Distribution						
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.24	0.21	0.5	0.0598	41.02%	0.00%
31243-101		5	0.728	0.639	0.817	0.74	0.64	0.81	0.0322	9.88%	-123.31%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.5	0.24	0.21	0.44	0.24					
31243-101		0.67	0.81	0.78	0.64	0.74					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-2845-4360		Endpoint: 4-4'-DDE			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 failed 4-4'-dde					44.19%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	4.78	1.86	0.144	8	CDF	7.0E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.51	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.34225		0.34225	1	22.8	0.0014	Significant Effect				
Error	0.12004		0.015005	8							
Total	0.46229			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.47	23.2	0.7161	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.798	0.741	0.0136	Normal Distribution				
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.24	0.21	0.5	0.0598	41.02%	0.00%
31243-102		5	0.696	0.559	0.833	0.64	0.6	0.83	0.0493	15.82%	-113.50%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.5	0.24	0.21	0.44	0.24					
31243-102		0.61	0.6	0.8	0.83	0.64					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-4310-6027		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 failed 4-4'-dde				41.84%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	7.93	1.86	0.136	8	CDF	2.3E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.59	2.29	0.9288	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.84681	0.84681	1	63	4.6E-05	Significant Effect					
Error	0.1076	0.01345	8								
Total	0.95441		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.98	23.2	0.5238	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.857	0.741	0.0712	Normal Distribution						
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.24	0.21	0.5	0.0598	41.02%	0.00%
31243-103		5	0.908	0.79	1.03	0.91	0.81	1.03	0.0425	10.46%	-178.53%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.5	0.24	0.21	0.44	0.24					
31243-103		0.81	1.03	0.82	0.91	0.97					

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Bioaccumulation Evaluation - Pesticides - Macoma										EnviroSystems, Inc.	
Analysis ID: 15-9191-3395		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-104 passed 4-4'-dde				52.68%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	25	n/a	1	8	Exact	0.3214	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.32	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00121	0.00121	1	0.0567	0.8177	Non-Significant Effect					
Error	0.1706	0.021325	8								
Total	0.17181		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.39	23.2	0.7598	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.753	0.741	0.0039	Non-Normal Distribution					
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.24	0.21	0.5	0.0598	41.02%	0.00%
31243-104		5	0.348	0.153	0.543	0.24	0.22	0.53	0.0704	45.23%	-6.75%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.5	0.24	0.21	0.44	0.24					
31243-104		0.24	0.53	0.51	0.24	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-6038-0996		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed 4-4'-dde				39.19%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-1.54	2.13	0.128	4	CDF	0.9002	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.95	2.29	0.2906	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.02116	0.02116	1	2.36	0.1633	Non-Significant Effect					
Error	0.07184	0.00898	8								
Total	0.093		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	224	23.2	1.2E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.903	0.741	0.2384	Normal Distribution						
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.326	0.16	0.492	0.24	0.21	0.5	0.0598	41.02%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	28.22%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.5	0.24	0.21	0.44	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-2679-5973		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed 4-4'-ddt				7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-0027-9913		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed 4-4'-ddt				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-4568-9081		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed 4-4'-ddt				6.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Report Date: 05 Feb-19 15:50 (p 14 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-9430-2453		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed 4-4'-ddt				48.91%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	25	n/a	2	8	Exact	0.3611	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.66	2.29	7.2E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.009	0.009	1	0.984	0.3504	Non-Significant Effect					
Error	0.0732	0.00915	8								
Total	0.0822		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	90.5	23.2	7.1E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.69	0.741	6.7E-04	Non-Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.29	0.123	0.457	0.24	0.22	0.53	0.0602	46.39%	-26.09%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.53	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:50 (p 15 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-3079-8205	Endpoint:	4-4'-DDT			CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48	Analysis:	Nonparametric-Two Sample			Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed 4-4'-ddt			7.23%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	20	n/a	2	7	Exact	0.5952	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0012	0.0001714	7								
Total	0.0012		8								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.5	46.2	0.7698	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.751	0.701	0.0055	Non-Normal Distribution				
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		4	0.23	0.212	0.248	0.23	0.22	0.24	0.00577	5.02%	0.00%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	Outlier	0.22	0.24	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-5563-3973		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed 4-4'-ddt			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409		Normal Distribution				
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 10-5890-1541		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed aldrin				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.0016		0.0002	8							
Total	0.0016			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 15-2346-9392	Endpoint: aldrin		CETIS Version: CETISv1.9.3		Official Results: Yes						
Analyzed: 05 Feb-19 15:48	Analysis: Parametric-Two Sample										
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result		PMSD						
Untransformed	C < T		31243-102 passed aldrin		6.47%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.68	2.29	0.7304	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.67	23.2	0.6328	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.946	0.741	0.6223	Normal Distribution					
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Report Date: 05 Feb-19 15:50 (p 19 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-8883-4371		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed aldrin				6.57%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 20 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-0260-6456		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed aldrin				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 21 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-1069-6462		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed aldrin				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 22 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-6563-3317		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed alpha chlordane	7.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 23 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-2677-4331		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed alpha chlordane					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 24 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-8929-1900		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed alpha chlordane					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 25 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma **EnviroSystems, Inc.**

Analysis ID: 20-4027-5678	Endpoint: alpha chlordane	CETIS Version: CETISv1.9.3
Analyzed: 05 Feb-19 15:48	Analysis: Nonparametric-Two Sample	Official Results: Yes

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	31243-104 passed alpha chlordane	56.94%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed		31243-104	25	n/a	2	8	Exact	0.3611	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.67	2.29	6.3E-04	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01225	0.01225	1	0.988	0.3494	Non-Significant Effect
Error	0.0992	0.0124	8			
Total	0.11145		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	123	23.2	3.9E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.682	0.741	5.4E-04	Non-Normal Distribution

alpha chlordane Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.3	0.105	0.495	0.24	0.22	0.58	0.0701	52.28%	-30.43%

alpha chlordane Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.24	0.24	0.21	0.22	0.24
31243-104		0.24	0.58	0.22	0.24	0.22

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 26 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-5534-0272		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed alpha chlordane				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 27 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	13-6008-2815		Endpoint:	cis-Nonachlor		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result			PMSD				
Untransformed	C < T			31243-101 passed cis-nonachlor			7.23%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 28 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-7473-6332		Endpoint:	cis-Nonachlor		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed cis-nonachlor				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 29 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-9424-6754		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed cis-nonachlor					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 30 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 08-2697-3040		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed cis-nonachlor				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:50 (p 31 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-4586-0893		Endpoint:	cis-Nonachlor		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:49		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed cis-nonachlor	6.05%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Report Date: 05 Feb-19 15:50 (p 32 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-6611-2758		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed dieldrin			7.23%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Report Date: 05 Feb-19 15:50 (p 33 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-4399-5028		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed dieldrin			6.47%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma										EnviroSystems, Inc.	
Analysis ID: 18-0185-2594		Endpoint: Dieldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed dieldrin				39.23%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	26	n/a	2	8	Exact	0.4048	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.65	2.29	8.2E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00576	0.00576	1	0.979	0.3515	Non-Significant Effect					
Error	0.04708	0.005885	8								
Total	0.05284		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		57.9	23.2	0.0017	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.698	0.741	8.3E-04	Non-Normal Distribution					
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.278	0.144	0.412	0.23	0.22	0.47	0.0481	38.69%	-20.87%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.47	0.23	0.23	0.22					

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Report Date: 05 Feb-19 15:50 (p 35 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-1472-0407		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 passed dieldrin			6.60%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	6.5E-07	1.89	0.015	7	CDF	0.5000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.551E-17	5.551E-17	1	3.89E-13	1.0000	Non-Significant Effect					
Error	0.001	0.0001429	7								
Total	0.001		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3	46.2	0.3935	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.844	0.701	0.0648	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		4	0.23	0.217	0.243	0.23	0.22	0.24	0.00408	3.55%	0.00%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	Outlier	0.23	0.23	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-4172-8521		Endpoint: Dieldrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed dieldrin				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:50 (p 37 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 19-5697-6840		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed dieldrin				6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-1064-8156	Endpoint: endosulfan I		CETIS Version: CETISv1.9.3								
Analyzed: 05 Feb-19 15:48	Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed endosulfan i			7.23%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.859	0.741	0.0742	Normal Distribution						
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-0781-2533		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed endosulfan i				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-9770-4534		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed endosulfan i					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma										EnviroSystems, Inc.	
Analysis ID: 06-2801-9638		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-104 passed endosulfan i				6.47%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-5916-7807		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed endosulfan i				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	17-4316-6277		Endpoint:	endosulfan II		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed endosulfan ii				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-9022-4840		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed endosulfan ii				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-9154-8130		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed endosulfan ii					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma										EnviroSystems, Inc.	
Analysis ID: 10-3282-9056		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed endosulfan ii					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-9731-1311		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed endosulfan ii				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-9026-3117		Endpoint: endrin			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed endrin					7.23%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-4221-9451		Endpoint: endrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed endrin	6.47%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.946	0.741	0.6223	Normal Distribution						
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 19-5460-0053		Endpoint: endrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed endrin	6.57%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.65	2.29	0.7865	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	23.2	0.6866	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1779	Normal Distribution						
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-1859-3737		Endpoint: endrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed endrin				6.47%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.68	2.29	0.7304	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	23.2	0.6328	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.741	0.0249	Normal Distribution						
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-4555-4935		Endpoint: endrin		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed endrin			6.05%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.837	0.741	0.0409	Normal Distribution						
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 03-0725-1606		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed gamma-bhc (lindane)					7.23%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.0016		0.0002	8							
Total	0.0016			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	15-4372-8732		Endpoint:	gamma-BHC (Lindane)		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed gamma-bhc (lindane)				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	1	0.3466	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00144		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-1343-1487		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed gamma-bhc (lindane)					6.57%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-3950-2973		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed gamma-bhc (lindane)					6.47%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1E-05	1E-05	1	0.0625	0.8089	Non-Significant Effect					
Error	0.00128	0.00016	8								
Total	0.00129		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	10-1207-7613		Endpoint:	gamma-BHC (Lindane)		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:49		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed gamma-bhc (lindane)			6.05%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.5	23.2	0.3965	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.837	0.741	0.0409	Normal Distribution					
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 13-2080-0006		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed gamma-chlordane				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-7624-2648		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 failed gamma-chlordane				79.95%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	21.4	2.13	0.184	4	CDF	1.4E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.18	2.29	0.0992	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	8.55625		8.55625	1	460	<1.0E-37	Significant Effect				
Error	0.1488		0.0186	8							
Total	8.70505			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			185	23.2	1.7E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.889	0.741	0.1647	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	2.08	1.84	2.32	2.1	1.8	2.3	0.086	9.25%	-804.35%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		1.8	2.3	2.2	2.1	2					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 02-6843-2915		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed gamma-chlordane				47.62%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	23.9	2.13	0.11	4	CDF	9.0E-06	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.09	2.29	0.1566		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	3.78225		3.78225	1	573	<1.0E-37		Significant Effect			
Error	0.0528		0.0066	8							
Total	3.83505			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			65	23.2	0.0014		Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.919	0.741	0.3520		Normal Distribution			
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	1.46	1.32	1.6	1.5	1.3	1.6	0.051	7.81%	-534.78%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		1.3	1.5	1.5	1.4	1.6					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-5584-2949		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 failed gamma-chlordane					292.60%		
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	2.52	2.13	0.673	4	CDF	0.0326	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.28	2.29	0.0527	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.58404	1.58404	1	6.36	0.0357	Significant Effect					
Error	1.99312	0.24914	8								
Total	3.57716		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2490	23.2	9.7E-07	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.822	0.741	0.0268	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	1.03	0.15	1.9	1	0.24	2.1	0.316	68.79%	-346.09%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.59	2.1	1	0.24	1.2					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 16-3389-7020		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed gamma-chlordane				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-9387-0911		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed heptachlor epoxide				6.63%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.361	1.86	0.031	8	CDF	0.6363	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.45	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	9.000E-05		9.000E-05	1	0.13	0.7273	Non-Significant Effect				
Error	0.00552		0.00069	8							
Total	0.00561			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.51	23.2	0.6998	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.878	0.741	0.1239	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-101		5	0.46	0.431	0.489	0.45	0.44	0.49	0.0105	5.10%	1.29%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-101		0.44	0.45	0.49	0.44	0.48					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	13-5196-9210		Endpoint:	heptachlor epoxide			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-102 passed heptachlor epoxide					5.81%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.37	1.86	0.027	8	CDF	0.8966	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.66	2.29	0.7705	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.001	0.001	1	1.89	0.2068	Non-Significant Effect					
Error	0.00424	0.00053	8								
Total	0.00524		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.61	23.2	0.2416	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.915	0.741	0.3206	Normal Distribution						
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-102		5	0.446	0.427	0.465	0.44	0.43	0.47	0.00678	3.40%	4.29%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-102		0.43	0.47	0.44	0.45	0.44					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	18-7463-8797		Endpoint:	heptachlor epoxide			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 passed heptachlor epoxide					6.56%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.852	1.86	0.031	8	CDF	0.7905	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.47	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00049	0.00049	1	0.726	0.4190	Non-Significant Effect					
Error	0.0054	0.000675	8								
Total	0.00589		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.6	23.2	0.6616	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.741	0.1410	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-103		5	0.452	0.424	0.48	0.46	0.42	0.48	0.0102	5.05%	3.00%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-103		0.48	0.42	0.46	0.46	0.44					

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Report Date: 05 Feb-19 15:50 (p 66 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-0177-5320		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed heptachlor epoxide				6.91%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.462	1.86	0.032	8	CDF	0.6718	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.39	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	0.213	0.6565	Non-Significant Effect				
Error	0.006		0.00075	8							
Total	0.00616			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.24	23.2	0.8406	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1277	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-104		5	0.458	0.426	0.49	0.45	0.43	0.49	0.0116	5.65%	1.72%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-104		0.49	0.45	0.43	0.48	0.44					

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Report Date: 05 Feb-19 15:50 (p 67 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	13-9494-3720		Endpoint:	heptachlor epoxide			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:49		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 passed heptachlor epoxide					6.63%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.241	1.86	0.031	8	CDF	0.4079	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.45	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.058	0.8158	Non-Significant Effect					
Error	0.00552	0.00069	8								
Total	0.00556		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.51	23.2	0.6998	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.816	0.741	0.0227	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-105		5	0.47	0.441	0.499	0.48	0.44	0.49	0.0105	4.99%	-0.86%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-105		0.49	0.49	0.44	0.48	0.45					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	21-1171-5849	Endpoint:	heptachlor	CETIS Version:	CETISv1.9.3						
Analyzed:	05 Feb-19 15:48	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed heptachlor			7.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.5	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1	23.2	1.0000	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.859	0.741	0.0742	Normal Distribution					
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-1415-0550		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed heptachlor				6.47%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	19-4755-2897		Endpoint:	heptachlor			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 passed heptachlor					6.57%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4E-05	4E-05	1	0.242	0.6357	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00136		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

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Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-2526-2340		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed heptachlor				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

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Report Date: 05 Feb-19 15:50 (p 72 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-2225-4717		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed heptachlor				6.05%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 73 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 21-1978-5423	Endpoint: hexachlorobenzene		CETIS Version: CETISv1.9.3								
Analyzed: 05 Feb-19 15:48	Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed hexachlorobenzene			6.63%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.361	1.86	0.031	8	CDF	0.6363	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.45	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9.000E-05	9.000E-05	1	0.13	0.7273	Non-Significant Effect					
Error	0.00552	0.00069	8								
Total	0.00561		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.51	23.2	0.6998	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.878	0.741	0.1239	Normal Distribution					
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-101		5	0.46	0.431	0.489	0.45	0.44	0.49	0.0105	5.10%	1.29%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-101		0.44	0.45	0.49	0.44	0.48					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 18-3082-0549		Endpoint: hexachlorobenzene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed hexachlorobenzene				5.81%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.37	1.86	0.027	8	CDF	0.8966	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.66	2.29	0.7705	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	1.89	0.2068	Non-Significant Effect				
Error	0.00424		0.00053	8							
Total	0.00524			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.61	23.2	0.2416	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.915	0.741	0.3206	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-102		5	0.446	0.427	0.465	0.44	0.43	0.47	0.00678	3.40%	4.29%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-102		0.43	0.47	0.44	0.45	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 01-7834-5061		Endpoint: hexachlorobenzene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed hexachlorobenzene				6.56%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.852	1.86	0.031	8	CDF	0.7905	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.47	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00049		0.00049	1	0.726	0.4190	Non-Significant Effect				
Error	0.0054		0.000675	8							
Total	0.00589			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.6	23.2	0.6616	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.741	0.1410	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-103		5	0.452	0.424	0.48	0.46	0.42	0.48	0.0102	5.05%	3.00%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-103		0.48	0.42	0.46	0.46	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	10-0999-1594		Endpoint:	hexachlorobenzene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-104 passed hexachlorobenzene					6.91%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.462	1.86	0.032	8	CDF	0.6718	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.39	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	0.213	0.6565	Non-Significant Effect					
Error	0.006	0.00075	8								
Total	0.00616		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.24	23.2	0.8406	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1277	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-104		5	0.458	0.426	0.49	0.45	0.43	0.49	0.0116	5.65%	1.72%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-104		0.49	0.45	0.43	0.48	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-1001-3399		Endpoint: hexachlorobenzene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed hexachlorobenzene					6.63%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.241	1.86	0.031	8	CDF	0.4079	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.45	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.058	0.8158	Non-Significant Effect				
Error	0.00552		0.00069	8							
Total	0.00556			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.51	23.2	0.6998	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.816	0.741	0.0227	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-105		5	0.47	0.441	0.499	0.48	0.44	0.49	0.0105	4.99%	-0.86%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-105		0.49	0.49	0.44	0.48	0.45					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 04-9035-9936		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed methoxychlor					6.83%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.176	1.86	0.064	8	CDF	0.5676	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.38	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	9.000E-05		9.000E-05	1	0.0309	0.8649	Non-Significant Effect				
Error	0.02332		0.002915	8							
Total	0.02341			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.61	23.2	0.6540	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.848	0.741	0.0547	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.96	0.86	0.98	0.0268	6.45%	0.00%
31243-101		5	0.924	0.865	0.983	0.9	0.88	0.98	0.0211	5.11%	0.65%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.98	0.96	0.86	0.87	0.98					
31243-101		0.89	0.9	0.98	0.88	0.97					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-7413-4406		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed methoxychlor					6.10%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.31	1.86	0.057	8	CDF	0.8870	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.54	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	1.72	0.2260	Non-Significant Effect				
Error	0.0186		0.002325	8							
Total	0.0226			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.43	23.2	0.2599	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.898	0.741	0.2080	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.96	0.86	0.98	0.0268	6.45%	0.00%
31243-102		5	0.89	0.85	0.93	0.89	0.85	0.94	0.0145	3.64%	4.30%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.98	0.96	0.86	0.87	0.98					
31243-102		0.85	0.94	0.88	0.89	0.89					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-2085-5391		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed methoxychlor					6.58%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.547	1.86	0.061	8	CDF	0.7003	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.43	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0008100		0.0008100	1	0.299	0.5995	Non-Significant Effect				
Error	0.02168		0.00271	8							
Total	0.02249			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.98	23.2	0.5251	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.843	0.741	0.0485	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.96	0.86	0.98	0.0268	6.45%	0.00%
31243-103		5	0.912	0.859	0.965	0.93	0.85	0.96	0.0191	4.68%	1.94%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.98	0.96	0.86	0.87	0.98					
31243-103		0.96	0.85	0.93	0.93	0.89					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-0283-6331		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed methoxychlor				6.88%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.349	1.86	0.064	8	CDF	0.6319	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.36	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00036		0.00036	1	0.122	0.7363	Non-Significant Effect				
Error	0.02368		0.00296	8							
Total	0.02404			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.55	23.2	0.6807	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.825	0.741	0.0289	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.96	0.86	0.98	0.0268	6.45%	0.00%
31243-104		5	0.918	0.858	0.978	0.89	0.87	0.97	0.0215	5.25%	1.29%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.98	0.96	0.86	0.87	0.98					
31243-104		0.97	0.89	0.87	0.97	0.89					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 06-6016-5571		Endpoint: Methoxychlor		CETIS Version: CETISv1.9.3							
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed methoxychlor			6.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.373	1.86	0.06	8	CDF	0.3594	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.46	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00036		0.00036	1	0.139	0.7187	Non-Significant Effect				
Error	0.02068		0.002585	8							
Total	0.02104			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.29	23.2	0.4413	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.847	0.741	0.0533	Normal Distribution					
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.93	0.856	1	0.96	0.86	0.98	0.0268	6.45%	0.00%
31243-105		5	0.942	0.893	0.991	0.96	0.89	0.98	0.0177	4.21%	-1.29%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.98	0.96	0.86	0.87	0.98					
31243-105		0.97	0.98	0.89	0.96	0.91					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 00-8542-5518		Endpoint: oxychlordan			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed oxychlordan				7.30%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.0557	1.89	0.034	7	CDF	0.5214	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	2.222E-06		2.222E-06	1	0.0031	0.9572	Non-Significant Effect				
Error	0.00502		0.0007171	7							
Total	0.0050222			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.46	46.2	0.7851	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.834	0.701	0.0489	Normal Distribution				
oxychlordan Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-101		4	0.465	0.427	0.503	0.465	0.44	0.49	0.0119	5.12%	0.21%
oxychlordan Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-101		0.44	0.45	0.49	Outlier	0.48					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 20-6177-0348		Endpoint: oxychlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed oxychlordane				6.70%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.27	1.89	0.031	7	CDF	0.8785	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00098		0.00098	1	1.63	0.2430	Non-Significant Effect				
Error	0.00422		0.0006029	7							
Total	0.0052			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.77	46.2	0.4294	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.901	0.701	0.2572	Normal Distribution				
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-102		4	0.445	0.417	0.473	0.44	0.43	0.47	0.00866	3.89%	4.51%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-102		0.43	0.47	0.44	Outlier	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	15-7678-9530		Endpoint:	oxychlordane		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:48		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed oxychlordane			6.56%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.852	1.86	0.031	8	CDF	0.7905	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.47	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00049	0.00049	1	0.726	0.4190	Non-Significant Effect					
Error	0.0054	0.000675	8								
Total	0.00589		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.6	23.2	0.6616	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.883	0.741	0.1410	Normal Distribution					
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-103		5	0.452	0.424	0.48	0.46	0.42	0.48	0.0102	5.05%	3.00%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-103		0.48	0.42	0.46	0.46	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-2081-6672		Endpoint: oxychlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed oxychlordane				6.91%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.462	1.86	0.032	8	CDF	0.6718	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.39	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	0.213	0.6565	Non-Significant Effect				
Error	0.006		0.00075	8							
Total	0.00616			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.24	23.2	0.8406	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1277	Normal Distribution				
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-104		5	0.458	0.426	0.49	0.45	0.43	0.49	0.0116	5.65%	1.72%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-104		0.49	0.45	0.43	0.48	0.44					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-7788-5162		Endpoint: oxychlordane			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:49		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed oxychlordane					6.63%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.241	1.86	0.031	8	CDF	0.4079	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.45	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.058	0.8158	Non-Significant Effect				
Error	0.00552		0.00069	8							
Total	0.00556			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.51	23.2	0.6998	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.816	0.741	0.0227	Normal Distribution				
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.466	0.43	0.502	0.48	0.43	0.49	0.0129	6.18%	0.00%
31243-105		5	0.47	0.441	0.499	0.48	0.44	0.49	0.0105	4.99%	-0.86%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.49	0.48	0.43	0.44	0.49					
31243-105		0.49	0.49	0.44	0.48	0.45					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 12-2441-4271		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed toxaphene					5.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.577	1.86	0.644	8	CDF	0.7102	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.16	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.1	0.1	1	0.333	0.5796	Non-Significant Effect					
Error	2.4	0.3	8								
Total	2.5		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.799	0.741	0.0142	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-101		5	11.4	10.7	12.1	11	11	12	0.245	4.80%	1.72%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	12	12	11	11	12					
31243-101		11	11	12	11	12					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 05-7163-2231		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed toxaphene					5.07%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.26	1.86	0.588	8	CDF	0.8792	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.7	2.29	0.6884	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.4		0.4	1	1.6	0.2415	Non-Significant Effect				
Error	2		0.25	8							
Total	2.4			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.5	23.2	0.7040	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.89	0.741	0.1713	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-102		5	11.2	10.6	11.8	11	11	12	0.2	3.99%	3.45%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	12	12	11	11	12					
31243-102		11	12	11	11	11					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 07-6884-9096		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed toxaphene					5.55%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	27.5	n/a	2	8	Exact	0.7381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.16	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	2.4	0.3	8								
Total	2.4		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.64	0.741	1.7E-04	Non-Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-103		5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	12	12	11	11	12					
31243-103		12	11	12	12	11					

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Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 11-1161-8841		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed toxaphene					5.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.577	1.86	0.644	8	CDF	0.7102	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.16	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.1	0.1	1	0.333	0.5796	Non-Significant Effect					
Error	2.4	0.3	8								
Total	2.5		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.799	0.741	0.0142	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-104		5	11.4	10.7	12.1	11	11	12	0.245	4.80%	1.72%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	12	12	11	11	12					
31243-104		12	11	11	12	11					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 92 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	14-8164-0987		Endpoint:	toxaphene			CETIS Version:	CETISv1.9.3			
Analyzed:	05 Feb-19 15:49		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 passed toxaphene					5.55%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	27.5	n/a	2	8	Exact	0.7381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.16	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	2.4	0.3	8								
Total	2.4		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.64	0.741	1.7E-04	Non-Normal Distribution						
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-105		5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	12	12	11	11	12					
31243-105		12	12	11	12	11					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 93 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 17-3809-4452		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	27d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed trans-nonachlor				7.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.33E-07	1.86	0.017	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.5	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.0016	0.0002	8								
Total	0.0016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.859	0.741	0.0742	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	0.00%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 94 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 14-5550-0612		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed trans-nonachlor				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1	1.86	0.015	8	CDF	0.8267	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	1	0.3466	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00144			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6223	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-102		5	0.222	0.208	0.236	0.22	0.21	0.24	0.0049	4.93%	3.48%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-102		0.21	0.24	0.22	0.22	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 95 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 09-1382-8135		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	26d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed trans-nonachlor				6.57%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.492	1.86	0.015	8	CDF	0.6822	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7865	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.242	0.6357	Non-Significant Effect				
Error	0.00132		0.000165	8							
Total	0.00136			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.54	23.2	0.6866	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.892	0.741	0.1779	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-103		5	0.226	0.212	0.24	0.23	0.21	0.24	0.0051	5.05%	1.74%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-103		0.24	0.21	0.23	0.23	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 96 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID: 19-6979-3914		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 05 Feb-19 15:48		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed trans-nonachlor				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.25	1.86	0.015	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.68	2.29	0.7304	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1E-05		1E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00128		0.00016	8							
Total	0.00129			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	23.2	0.6328	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.819	0.741	0.0249	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-104		5	0.228	0.214	0.242	0.22	0.22	0.24	0.0049	4.80%	0.87%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-104		0.24	0.22	0.22	0.24	0.22					

CETIS Analytical Report

Report Date: 05 Feb-19 15:50 (p 97 of 97)
Test Code: 31249Mn-Pest | 00-8972-9558

Bioaccumulation Evaluation - Pesticides - Macoma							EnviroSystems, Inc.				
Analysis ID:	17-5794-1762		Endpoint:	trans-nonachlor		CETIS Version:	CETISv1.9.3				
Analyzed:	05 Feb-19 15:49		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	29d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	28d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed trans-nonachlor				6.05%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.535	1.86	0.014	8	CDF	0.3038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.837	0.741	0.0409	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.23	0.212	0.248	0.24	0.21	0.24	0.00632	6.15%	0.00%
31243-105		5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	-1.74%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.24	0.24	0.21	0.22	0.24					
31243-105		0.24	0.24	0.22	0.24	0.23					

Nereis virens
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
Trace Metals

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
Metals (ug/g wet weight)						
Arsenic	2.1		2.1		2.0	
Cadmium	0.030	J	0.030	J	0.030	J
Chromium	0.30	J	0.29	J	0.29	J
Copper	1.1		1.2		1.1	
Lead	0.25		0.26		0.25	
Mercury	0.0030	J	0.0017	U	0.0017	U
Nickel	0.29		0.31		0.31	
Zinc	7.7		7.8		7.6	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.6		1.5		1.3		1.5		1.7	
Cadmium	0.030	J	0.033	J	0.026	J	0.027	J	0.028	J
Chromium	0.081	J	0.065	J	0.056	J	0.11	J	0.052	J
Copper	1.3		1.1		1.2		1.1		1.2	
Lead	0.16		0.17		0.18		0.16		0.18	
Mercury	0.0016	U	0.0016	U	0.0018	U	0.0015	U	0.0016	U
Nickel	0.14		0.12		0.11		0.14		0.096	
Zinc	14.0		20.2		5.6		5.7		6.8	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.2		1.4		1.6		1.0		1.2	
Cadmium	0.023	J	0.032	J	0.029	J	0.027	J	0.029	J
Chromium	0.039	J	0.087	J	0.083	J	0.037	J	0.058	J
Copper	0.79		1.1		1.1		0.74		0.92	
Lead	0.10		0.20		0.16		0.16		0.21	
Mercury	0.0017	U	0.0016	U	0.0015	U	0.0018	U	0.0015	U
Nickel	0.074	J	0.10		0.14		0.088	J	0.11	
Zinc	4.9		6.3		29.4		4.5		5.4	

* = Qualifiers

U Analyte not detected; below Method Detection Limit

J Analyte estimated; detection below Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.6		1.4		1.5		1.5		1.5	
Cadmium	0.041		0.037		0.019 J		0.027 J		0.023 J	
Chromium	0.047 J		0.074 J		0.075 J		0.067 J		0.094 J	
Copper	1.1		0.93		0.98		1.3		1.1	
Lead	0.30		0.20		0.11		0.19		0.16	
Mercury	0.0016 U		0.0016 U		0.0080 J		0.0060 J		0.0070 J	
Nickel	0.10		0.13		0.11		0.11		0.12	
Zinc	7.1		5.9		6.1		7.5		6.8	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.1		1.6		1.6		1.5		1.5	
Cadmium	0.024	J	0.032	J	0.028	J	0.026	J	0.031	J
Chromium	0.042	J	0.063	J	0.075	J	0.080	J	0.057	J
Copper	0.79		1.3		1.2		1.3		1.1	
Lead	0.12		0.19		0.14		0.20		0.20	
Mercury	0.0016	U	0.0060	J	0.0040	J	0.0080	J	0.0040	J
Nickel	0.096		0.14		0.16		0.15		0.11	
Zinc	4.7		22.3		7.2		7.0		12.3	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.6		1.5		1.1		1.5		1.5	
Cadmium	0.023	J	0.022	J	0.019	J	0.020	J	0.025	J
Chromium	0.083	J	0.097	J	0.050	J	0.076	J	0.081	J
Copper	1.1		1.2		0.93		1.1		1.2	
Lead	0.13		0.13		0.14		0.12		0.15	
Mercury	0.0080	J	0.0080	J	0.0040	J	0.0060	J	0.010	J
Nickel	0.14		0.13		0.076	J	0.12		0.12	
Zinc	7.2		6.7		26.9		6.5		20.7	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Metals (ug/g wet weight)										
Arsenic	1.7		1.6		1.4		1.6		1.5	
Cadmium	0.030	J	0.026	J	0.021	J	0.025	J	0.020	J
Chromium	0.072	J	0.073	J	0.075	J	0.090	J	0.087	J
Copper	1.7		1.5		1.2		1.3		1.3	
Lead	0.19		0.16		0.099		0.15		0.14	
Mercury	0.010	J	0.0080	J	0.0090	J	0.010	J	0.0080	J
Nickel	0.25		0.15		0.12		0.13		0.13	
Zinc	8.1		8.0		32.6		6.9		15.0	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 07 Feb-19 08:40 (p 1 of 1)

Test Code/ID: 20-6215-6556/31250Nv-Met

Bioaccumulation Evaluation - Metals - Nereis virens **EnviroSystems, Inc.**

Start Date: 20 Nov-18 12:01 **Species:** Nereis virens **Sample Code:** 31250-000
End Date: 18 Dec-18 12:01 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 20 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Nv)

Sample	Rep	Pos	Body Burden	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Silver
31242-008	1	6		1.6	0.03	0.081	1.3	0.16	0.0016	0.14	14	
31242-008	2	8		1.5	0.033	0.065	1.1	0.17	0.0016	0.12	20.2	
31242-008	3	18		1.3	0.026	0.056	1.2	0.18	0.0018	0.11	5.6	
31242-008	4	23		1.5	0.027	0.11	1.1	0.16	0.0015	0.14	5.7	
31242-008	5	28		1.7	0.028	0.052	1.2	0.18	0.0016	0.1	6.8	
31243-101	1	1		1.2	0.023	0.039	0.79	0.1	0.0017	0.074	4.9	
31243-101	2	11		1.4	0.032	0.087	1.1	0.2	0.0016	0.1	6.3	
31243-101	3	17		1.6	0.029	0.083	1.1	0.16	0.0015	0.14	29.4	
31243-101	4	19		1	0.027	0.037	0.74	0.16	0.0018	0.088	4.5	
31243-101	5	30		1.2	0.029	0.058	0.92	0.21	0.0015	0.11	5.4	
31243-102	1	4		1.6	0.041	0.047	1.1	0.3	0.0016	0.1	7.1	
31243-102	2	9		1.4	0.037	0.074	0.93	0.2	0.0016	0.13	5.9	
31243-102	3	15		1.5	0.019	0.075	0.98	0.11	0.008	0.11	6.1	
31243-102	4	20		1.5	0.027	0.067	1.3	0.19	0.006	0.11	7.5	
31243-102	5	26		1.5	0.023	0.094	1.1	0.16	0.007	0.12	6.8	
31243-103	1	2		1.1	0.024	0.042	0.79	0.12	0.0016	0.1	4.7	
31243-103	2	7		1.6	0.032	0.063	1.3	0.19	0.006	0.14	22.3	
31243-103	3	16		1.6	0.028	0.075	1.2	0.14	0.004	0.16	7.2	
31243-103	4	22		1.5	0.026	0.08	1.3	0.2	0.008	0.15	7	
31243-103	5	27		1.5	0.031	0.057	1.1	0.2	0.004	0.11	12.3	
31243-104	1	3		1.6	0.023	0.083	1.1	0.13	0.008	0.14	7.2	
31243-104	2	10		1.5	0.022	0.097	1.2	0.13	0.008	0.13	6.7	
31243-104	3	14		1.1	0.019	0.05	0.93	0.14	0.004	0.076	26.9	
31243-104	4	24		1.5	0.02	0.076	1.1	0.12	0.006	0.12	6.5	
31243-104	5	25		1.5	0.025	0.081	1.2	0.15	0.01	0.12	20.7	
31243-105	1	5		1.7	0.03	0.072	1.7	0.19	0.01	0.25	8.1	
31243-105	2	12		1.6	0.026	0.073	1.5	0.16	0.008	0.15	8	
31243-105	3	13		1.4	0.021	0.075	1.2	0.1	0.009	0.12	32.6	
31243-105	4	21		1.6	0.025	0.09	1.3	0.15	0.01	0.13	6.9	
31243-105	5	29		1.5	0.02	0.087	1.3	0.14	0.008	0.13	15	

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 1 of 6)
 Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens	EnviroSystems, Inc.
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Batch ID: 14-7242-1237	Test Type: Bioaccumulation - Metals	Analyst: Nancy Roka
Start Date: 20 Nov-18 12:01	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 18 Dec-18 12:01	Species: Nereis virens	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
13-3255-9262	Arsenic	Equal Variance t Two-Sample Test	0.9580	31243-101 passed arsenic
13-1020-6345	Arsenic	Equal Variance t Two-Sample Test	0.6038	31243-102 passed arsenic
10-6798-3795	Arsenic	Equal Variance t Two-Sample Test	0.6935	31243-103 passed arsenic
01-1522-6896	Arsenic	Equal Variance t Two-Sample Test	0.7570	31243-104 passed arsenic
16-2920-1927	Arsenic	Equal Variance t Two-Sample Test	0.3227	31243-105 passed arsenic
18-6989-4905	Cadmium	Equal Variance t Two-Sample Test	0.6550	31243-101 passed cadmium
16-8345-2970	Cadmium	Equal Variance t Two-Sample Test	0.4468	31243-102 passed cadmium
19-7281-6676	Cadmium	Equal Variance t Two-Sample Test	0.6172	31243-103 passed cadmium
00-1822-0066	Cadmium	Equal Variance t Two-Sample Test	0.9986	31243-104 passed cadmium
13-3527-0827	Cadmium	Equal Variance t Two-Sample Test	0.9603	31243-105 passed cadmium
16-3707-1616	Chromium	Equal Variance t Two-Sample Test	0.7777	31243-101 passed chromium
13-1652-7153	Chromium	Equal Variance t Two-Sample Test	0.5416	31243-102 passed chromium
14-3376-6970	Chromium	Equal Variance t Two-Sample Test	0.7628	31243-103 passed chromium
18-5452-5382	Chromium	Equal Variance t Two-Sample Test	0.3668	31243-104 passed chromium
05-6138-4604	Chromium	Equal Variance t Two-Sample Test	0.2861	31243-105 passed chromium
05-9115-2817	Copper	Equal Variance t Two-Sample Test	0.9911	31243-101 passed copper
18-3116-3252	Copper	Equal Variance t Two-Sample Test	0.8889	31243-102 passed copper
05-2101-4778	Copper	Equal Variance t Two-Sample Test	0.2379	31243-103 passed copper
21-3021-9774	Copper	Equal Variance t Two-Sample Test	0.6548	31243-103 passed copper
20-5630-3518	Copper	Equal Variance t Two-Sample Test	0.8668	31243-104 passed copper
05-6651-2107	Copper	Equal Variance t Two-Sample Test	0.0265	31243-105 failed copper
15-6875-4498	Lead	Equal Variance t Two-Sample Test	0.5771	31243-101 passed lead
08-6320-2064	Lead	Equal Variance t Two-Sample Test	0.6029	31243-102 passed lead
00-1686-6927	Lead	Unequal Variance t Two-Sample Test	0.2619	31243-102 passed lead
05-0575-9466	Lead	Equal Variance t Two-Sample Test	0.5000	31243-103 passed lead
07-0519-8133	Lead	Equal Variance t Two-Sample Test	0.9996	31243-104 passed lead
21-0298-5795	Lead	Equal Variance t Two-Sample Test	0.9058	31243-105 passed lead
16-4273-9343	Mercury	Equal Variance t Two-Sample Test	0.5000	31243-101 passed mercury
07-8095-7860	Mercury	Unequal Variance t Two-Sample Test	0.0386	31243-102 failed mercury
02-0648-0266	Mercury	Unequal Variance t Two-Sample Test	0.0226	31243-103 failed mercury
07-7178-6438	Mercury	Unequal Variance t Two-Sample Test	0.0027	31243-104 failed mercury
18-1980-9582	Mercury	Unequal Variance t Two-Sample Test	4.0E-05	31243-105 failed mercury
06-2406-3040	Nickel	Equal Variance t Two-Sample Test	0.9043	31243-101 passed nickel

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 2 of 6)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
05-6440-5864	Nickel	Equal Variance t Two-Sample Test	0.7882	31243-102 passed nickel
12-4844-1242	Nickel	Equal Variance t Two-Sample Test	0.2487	31243-103 passed nickel
08-6608-9382	Nickel	Equal Variance t Two-Sample Test	0.6338	31243-104 passed nickel
02-8426-6158	Nickel	Equal Variance t Two-Sample Test	0.1079	31243-105 passed nickel
08-2362-8082	Nickel	Equal Variance t Two-Sample Test	0.1779	31243-105 passed nickel
13-3467-8356	Zinc	Unequal Variance t Two-Sample Test	0.9250	31243-101 passed zinc
17-2350-8699	Zinc	Wilcoxon Rank Sum Two-Sample Test	0.8889	31243-101 passed zinc
08-8093-1435	Zinc	Unequal Variance t Two-Sample Test	0.8684	31243-102 passed zinc
05-1603-5130	Zinc	Equal Variance t Two-Sample Test	0.4783	31243-103 passed zinc
16-8581-7927	Zinc	Equal Variance t Two-Sample Test	0.2800	31243-104 passed zinc
18-0355-3687	Zinc	Equal Variance t Two-Sample Test	0.2671	31243-105 passed zinc

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 3 of 6)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens											EnviroSystems, Inc.
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.3	1.7	0.0663	0.148	9.76%	0.00%
31243-101		5	1.28	0.997	1.56	1	1.6	0.102	0.228	17.82%	15.79%
31243-102		5	1.5	1.41	1.59	1.4	1.6	0.0316	0.0707	4.71%	1.32%
31243-103		5	1.46	1.2	1.72	1.1	1.6	0.0927	0.207	14.20%	3.95%
31243-104		5	1.44	1.2	1.68	1.1	1.6	0.0872	0.195	13.54%	5.26%
31243-105		5	1.56	1.42	1.7	1.4	1.7	0.051	0.114	7.31%	-2.63%
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.026	0.033	0.00124	0.00277	9.64%	0.00%
31243-101		5	0.028	0.0239	0.0321	0.023	0.032	0.00148	0.00332	11.85%	2.78%
31243-102		5	0.0294	0.0178	0.041	0.019	0.041	0.00417	0.00932	31.69%	-2.08%
31243-103		5	0.0282	0.024	0.0324	0.024	0.032	0.0015	0.00335	11.87%	2.08%
31243-104		5	0.0218	0.0188	0.0248	0.019	0.025	0.00107	0.00239	10.95%	24.31%
31243-105		5	0.0244	0.0194	0.0294	0.02	0.03	0.00181	0.00404	16.55%	15.28%
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.052	0.11	0.0106	0.0236	32.41%	0.00%
31243-101		5	0.0608	0.0315	0.0901	0.037	0.087	0.0106	0.0236	38.82%	16.48%
31243-102		5	0.0714	0.0504	0.0924	0.047	0.094	0.00757	0.0169	23.70%	1.92%
31243-103		5	0.0634	0.0447	0.0821	0.042	0.08	0.00674	0.0151	23.78%	12.91%
31243-104		5	0.0774	0.0561	0.0987	0.05	0.097	0.00769	0.0172	22.20%	-6.32%
31243-105		5	0.0794	0.0689	0.0899	0.072	0.09	0.00378	0.00844	10.63%	-9.07%
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.18	1.08	1.28	1.1	1.3	0.0374	0.0837	7.09%	0.00%
31243-101		5	0.93	0.721	1.14	0.74	1.1	0.0754	0.169	18.12%	21.19%
31243-102		5	1.08	0.905	1.26	0.93	1.3	0.0639	0.143	13.21%	8.31%
31243-103		5	1.14	0.875	1.4	0.79	1.3	0.0946	0.211	18.58%	3.56%
31243-104		5	1.11	0.969	1.24	0.93	1.2	0.0494	0.11	9.98%	6.27%
31243-105		5	1.4	1.15	1.65	1.2	1.7	0.0894	0.2	14.29%	-18.64%
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.16	0.18	0.00447	0.01	5.88%	0.00%
31243-101		5	0.166	0.112	0.22	0.1	0.21	0.0194	0.0434	26.12%	2.35%
31243-102		5	0.192	0.105	0.279	0.11	0.3	0.0312	0.0698	36.35%	-12.94%
31243-103		5	0.17	0.124	0.216	0.12	0.2	0.0167	0.0374	22.01%	0.00%
31243-104		5	0.134	0.12	0.148	0.12	0.15	0.0051	0.0114	8.51%	21.18%
31243-105		5	0.148	0.107	0.189	0.1	0.19	0.0146	0.0327	22.10%	12.94%
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0015	0.0018	0.000049	0.00011	6.76%	0.00%
31243-101		5	0.00162	0.00146	0.00178	0.0015	0.0018	5.83E-05	0.00013	8.05%	0.00%
31243-102		5	0.00484	0.00106	0.00862	0.0016	0.008	0.00136	0.00304	62.83%	-198.77%
31243-103		5	0.00472	0.00173	0.00771	0.0016	0.008	0.00108	0.00241	50.99%	-191.36%
31243-104		5	0.0072	0.00437	0.01	0.004	0.01	0.00102	0.00228	31.67%	-344.44%
31243-105		5	0.009	0.00776	0.0102	0.008	0.01	0.000447	0.001	11.11%	-455.56%

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 4 of 6)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens											EnviroSystems, Inc.
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.1	0.14	0.008	0.0179	14.66%	0.00%
31243-101		5	0.102	0.0714	0.133	0.074	0.14	0.0112	0.025	24.37%	16.07%
31243-102		5	0.114	0.0998	0.128	0.1	0.13	0.0051	0.0114	10.00%	6.56%
31243-103		5	0.132	0.0999	0.164	0.1	0.16	0.0116	0.0259	19.61%	-8.20%
31243-104		5	0.117	0.0868	0.148	0.076	0.14	0.0109	0.0245	20.89%	3.93%
31243-105		5	0.156	0.0894	0.223	0.12	0.25	0.024	0.0537	34.40%	-27.87%
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	5.6	20.2	2.89	6.46	61.79%	0.00%
31243-101		5	10.1	-3.32	23.5	4.5	29.4	4.83	10.8	107.03%	3.44%
31243-102		5	6.68	5.85	7.51	5.9	7.5	0.301	0.672	10.06%	36.14%
31243-103		5	10.7	1.94	19.5	4.7	22.3	3.15	7.05	65.93%	-2.29%
31243-104		5	13.6	1.72	25.5	6.5	26.9	4.28	9.57	70.36%	-30.02%
31243-105		5	14.1	0.688	27.6	6.9	32.6	4.84	10.8	76.61%	-34.99%

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 5 of 6)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.
Arsenic Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	1.6	1.5	1.3	1.5	1.7	
31243-101		1.2	1.4	1.6	1	1.2	
31243-102		1.6	1.4	1.5	1.5	1.5	
31243-103		1.1	1.6	1.6	1.5	1.5	
31243-104		1.6	1.5	1.1	1.5	1.5	
31243-105		1.7	1.6	1.4	1.6	1.5	
Cadmium Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.03	0.033	0.026	0.027	0.028	
31243-101		0.023	0.032	0.029	0.027	0.029	
31243-102		0.041	0.037	0.019	0.027	0.023	
31243-103		0.024	0.032	0.028	0.026	0.031	
31243-104		0.023	0.022	0.019	0.02	0.025	
31243-105		0.03	0.026	0.021	0.025	0.02	
Chromium Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.081	0.065	0.056	0.11	0.052	
31243-101		0.039	0.087	0.083	0.037	0.058	
31243-102		0.047	0.074	0.075	0.067	0.094	
31243-103		0.042	0.063	0.075	0.08	0.057	
31243-104		0.083	0.097	0.05	0.076	0.081	
31243-105		0.072	0.073	0.075	0.09	0.087	
Copper Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	1.3	1.1	1.2	1.1	1.2	
31243-101		0.79	1.1	1.1	0.74	0.92	
31243-102		1.1	0.93	0.98	1.3	1.1	
31243-103		0.79	1.3	1.2	1.3	1.1	
31243-104		1.1	1.2	0.93	1.1	1.2	
31243-105		1.7	1.5	1.2	1.3	1.3	
Lead Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.16	0.17	0.18	0.16	0.18	
31243-101		0.1	0.2	0.16	0.16	0.21	
31243-102		0.3	0.2	0.11	0.19	0.16	
31243-103		0.12	0.19	0.14	0.2	0.2	
31243-104		0.13	0.13	0.14	0.12	0.15	
31243-105		0.19	0.16	0.1	0.15	0.14	
Mercury Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016	
31243-101		0.0017	0.0016	0.0015	0.0018	0.0015	
31243-102		0.0016	0.0016	0.008	0.006	0.007	
31243-103		0.0016	0.006	0.004	0.008	0.004	
31243-104		0.008	0.008	0.004	0.006	0.01	
31243-105		0.01	0.008	0.009	0.01	0.008	

CETIS Summary Report

Report Date: 07 Feb-19 08:45 (p 6 of 6)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.
Nickel Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.14	0.12	0.11	0.14	0.1	
31243-101		0.074	0.1	0.14	0.088	0.11	
31243-102		0.1	0.13	0.11	0.11	0.12	
31243-103		0.1	0.14	0.16	0.15	0.11	
31243-104		0.14	0.13	0.076	0.12	0.12	
31243-105		0.25	0.15	0.12	0.13	0.13	
Zinc Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	14	20.2	5.6	5.7	6.8	
31243-101		4.9	6.3	29.4	4.5	5.4	
31243-102		7.1	5.9	6.1	7.5	6.8	
31243-103		4.7	22.3	7.2	7	12.3	
31243-104		7.2	6.7	26.9	6.5	20.7	
31243-105		8.1	8	32.6	6.9	15	

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Metals

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-1.972788	1.85955	0.9580097	0.05	FALSE	0.2262238	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.4136702	1.85955	0.6550086	0.05	FALSE	0.0035962	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.8039762	1.85955	0.777679	0.05	FALSE	0.02775527	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-2.971142	1.85955	0.99108	0.05	FALSE	0.1564675	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.2010078	1.85955	0.5771455	0.05	FALSE	0.03700454	8		C
Mercury	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	3.0572E-07	1.85955	0.4999999	0.05	FALSE	0.00014162	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-1.427353	1.85955	0.9043381	0.05	FALSE	0.02553478	8		C
Zinc	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	33		0.8888889	0.05	FALSE		8	0	E
Zinc	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	-1.777998	2.13185	0.9249831	0.05	FALSE	6.216893	4		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.2721655	1.85955	0.6038064	0.05	FALSE	0.1366483	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.1380131	1.85955	0.4468203	0.05	FALSE	0.00808422	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.10782	1.85955	0.5416032	0.05	FALSE	0.0241455	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.323358	1.85955	0.8888577	0.05	FALSE	0.137707	8		C
Lead	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	0.6977975	2.13185	0.2618693	0.05	FALSE	0.06721237	4		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.2708788	1.89458	0.6028511	0.05	FALSE	0.03497098	7		C
Mercury	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	2.366112	2.13185	0.0385735	0.05	TRUE	0.00290119	4		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	-0.8432742	1.85955	0.788215	0.05	FALSE	0.01764122	8		C
Zinc	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	-1.300821	2.13185	0.8684018	0.05	FALSE	6.19484	4		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.5262347	1.85955	0.6935011	0.05	FALSE	0.2120211	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.3086066	1.85955	0.6172479	0.05	FALSE	0.00361537	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.75068	1.85955	0.762828	0.05	FALSE	0.02328523	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-0.4129574	1.85955	0.654758	0.05	FALSE	0.1891261	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	0.7533706	1.89458	0.2378987	0.05	FALSE	0.1131661	7		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	0	1.85955	0.5000001	0.05	FALSE	0.03220832	8		C
Mercury	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	2.877286	2.13185	0.0225681	0.05	TRUE	0.00229686	4		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	0.7106691	1.85955	0.2487407	0.05	FALSE	0.02616616	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	0.05609276	1.85955	0.4783218	0.05	FALSE	7.956302	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.7302967	1.85955	0.756979	0.05	FALSE	0.2037033	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-4.275931	1.85955	0.9986488	0.05	FALSE	0.00304421	8		C
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.3523895	1.85955	0.3668248	0.05	FALSE	0.02427405	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-1.194792	1.85955	0.8668073	0.05	FALSE	0.1151719	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-5.307909	1.85955	0.9996393	0.05	FALSE	0.01261207	8		C
Mercury	Unequal Variance t Two-Sample Test	CLDS	vs Comp 5	5.465338	2.13185	0.0027255	0.05	TRUE	0.00217657	4		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	-0.3540148	1.85955	0.6337615	0.05	FALSE	0.02521317	8		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.6080477	1.85955	0.2800089	0.05	FALSE	9.602833	8		C
Arsenic	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.4780914	1.85955	0.3226882	0.05	FALSE	0.155581	8		C
Cadmium	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-2.008316	1.85955	0.9602574	0.05	FALSE	0.00407407	8		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Metals

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Chromium	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5889103	1.85955	0.2860854	0.05	FALSE	0.02084022	8		C
Copper	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	2.269126	1.85955	0.0264813	0.05	TRUE	0.1802899	8		C
Lead	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-1.438185	1.85955	0.9058368	0.05	FALSE	0.02844561	8		C
Mercury	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	16.40406	2.13185	4.042E-05	0.05	TRUE	0.00095909	4		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	1.343968	1.85955	0.1079131	0.05	FALSE	0.04704326	8		C
Nickel	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.9885381	1.89458	0.1779098	0.05	FALSE	0.02012373	7		C
Zinc	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.6494529	1.85955	0.267122	0.05	FALSE	10.47951	8		C

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 1 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 13-3255-9262		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed arsenic				14.88%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-1.97	1.86	0.226	8	CDF	0.9580	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.76	2.29	0.5586	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.144		0.144	1	3.89	0.0840	Non-Significant Effect				
Error	0.296		0.037	8							
Total	0.44			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.36	23.2	0.4252	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.979	0.741	0.9600	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.5	1.3	1.7	0.0663	9.76%	0.00%
31243-101		5	1.28	0.997	1.56	1.2	1	1.6	0.102	17.82%	15.79%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.6	1.5	1.3	1.5	1.7					
31243-101		1.2	1.4	1.6	1	1.2					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 2 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 13-1020-6345		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed arsenic				8.99%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.272	1.86	0.137	8	CDF	0.6038	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.01	2.29	0.2260	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.001		0.001	1	0.0741	0.7924	Non-Significant Effect				
Error	0.108		0.0135	8							
Total	0.109			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.4	23.2	0.1804	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.943	0.741	0.5896	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.5	1.3	1.7	0.0663	9.76%	0.00%
31243-102		5	1.5	1.41	1.59	1.5	1.4	1.6	0.0316	4.71%	1.32%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.6	1.5	1.3	1.5	1.7					
31243-102		1.6	1.4	1.5	1.5	1.5					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 3 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 10-6798-3795		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed arsenic				13.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.526	1.86	0.212	8	CDF	0.6935	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.12	2.29	0.1357	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.009		0.009	1	0.277	0.6130	Non-Significant Effect				
Error	0.26		0.0325	8							
Total	0.269			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.95	23.2	0.5322	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.867	0.741	0.0925	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.5	1.3	1.7	0.0663	9.76%	0.00%
31243-103		5	1.46	1.2	1.72	1.5	1.1	1.6	0.0927	14.20%	3.95%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.6	1.5	1.3	1.5	1.7					
31243-103		1.1	1.6	1.6	1.5	1.5					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 4 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 01-1522-6896		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed arsenic					13.40%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.73	1.86	0.204	8	CDF	0.7570	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.08	2.29	0.1619	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.016		0.016	1	0.533	0.4860	Non-Significant Effect				
Error	0.24		0.03	8							
Total	0.256			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.73	23.2	0.6095	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.861	0.741	0.0786	Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.5	1.3	1.7	0.0663	9.76%	0.00%
31243-104		5	1.44	1.2	1.68	1.5	1.1	1.6	0.0872	13.54%	5.26%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.6	1.5	1.3	1.5	1.7					
31243-104		1.6	1.5	1.1	1.5	1.5					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 5 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 16-2920-1927		Endpoint: Arsenic			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed arsenic				10.24%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.478	1.86	0.156	8	CDF	0.3227	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.76	2.29	0.5597		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.004		0.004	1	0.229	0.6454		Non-Significant Effect			
Error	0.14		0.0175	8							
Total	0.144			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		1.69	23.2	0.6228		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.967	0.741	0.8627		Normal Distribution				
Arsenic Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.52	1.34	1.7	1.5	1.3	1.7	0.0663	9.76%	0.00%
31243-105		5	1.56	1.42	1.7	1.6	1.4	1.7	0.051	7.31%	-2.63%
Arsenic Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.6	1.5	1.3	1.5	1.7					
31243-105		1.7	1.6	1.4	1.6	1.5					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 6 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 18-6989-4905		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed cadmium					12.49%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.414	1.86	0.004	8	CDF	0.6550	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.73	2.29	0.6144	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0000016	0.0000016	1	0.171	0.6900	Non-Significant Effect					
Error	0.0000748	9.35E-06	8								
Total	0.0000764		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.43	23.2	0.7380	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.96	0.741	0.7910	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.028	0.026	0.033	0.00124	9.64%	0.00%
31243-101		5	0.028	0.0239	0.0321	0.029	0.023	0.032	0.00148	11.85%	2.78%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.033	0.026	0.027	0.028					
31243-101		0.023	0.032	0.029	0.027	0.029					

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Report Date: 07 Feb-19 08:44 (p 7 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 16-8345-2970		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed cadmium				28.07%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.138	1.86	0.008	8	CDF	0.4468	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5143	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000009		0.0000009	1	0.019	0.8936	Non-Significant Effect				
Error	0.000378		4.725E-05	8							
Total	0.0003789			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			11.3	23.2	0.0377	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.976	0.741	0.9419	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.028	0.026	0.033	0.00124	9.64%	0.00%
31243-102		5	0.0294	0.0178	0.041	0.027	0.019	0.041	0.00417	31.69%	-2.08%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.033	0.026	0.027	0.028					
31243-102		0.041	0.037	0.019	0.027	0.023					

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Report Date: 07 Feb-19 08:44 (p 8 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 19-7281-6676		Endpoint: Cadmium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed cadmium					12.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.309	1.86	0.004	8	CDF	0.6172	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.45	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9E-07	9E-07	1	0.0952	0.7655	Non-Significant Effect					
Error	0.0000756	9.45E-06	8								
Total	0.0000765		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.45	23.2	0.7254	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.946	0.741	0.6157	Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.028	0.026	0.033	0.00124	9.64%	0.00%
31243-103		5	0.0282	0.024	0.0324	0.028	0.024	0.032	0.0015	11.87%	2.08%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.033	0.026	0.027	0.028					
31243-103		0.024	0.032	0.028	0.026	0.031					

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Report Date: 07 Feb-19 08:44 (p 9 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 00-1822-0066		Endpoint: Cadmium		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed cadmium			10.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-4.28	1.86	0.003	8	CDF	0.9986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.72	2.29	0.6402		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0001225		0.0001225	1	18.3	0.0027	Significant Effect				
Error	0.0000536		0.0000067	8							
Total	0.0001761			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		1.35	23.2	0.7778		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.925	0.741	0.4006		Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.028	0.026	0.033	0.00124	9.64%	0.00%
31243-104		5	0.0218	0.0188	0.0248	0.022	0.019	0.025	0.00107	10.95%	24.31%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.033	0.026	0.027	0.028					
31243-104		0.023	0.022	0.019	0.02	0.025					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 10 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 13-3527-0827		Endpoint: Cadmium		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed cadmium			14.15%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-2.01	1.86	0.004	8	CDF	0.9603	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.71	2.29	0.6528		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000484		0.0000484	1	4.03	0.0795	Non-Significant Effect				
Error	0.000096		0.000012	8							
Total	0.0001444			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.12	23.2	0.4855		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.961	0.741	0.7971		Normal Distribution				
Cadmium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0288	0.0254	0.0322	0.028	0.026	0.033	0.00124	9.64%	0.00%
31243-105		5	0.0244	0.0194	0.0294	0.025	0.02	0.03	0.00181	16.55%	15.28%
Cadmium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.03	0.033	0.026	0.027	0.028					
31243-105		0.03	0.026	0.021	0.025	0.02					

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Report Date: 07 Feb-19 08:44 (p 11 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 16-3707-1616		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed chromium				38.13%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.804	1.86	0.028	8	CDF	0.7777	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.67	2.29	0.7414	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00036		0.00036	1	0.646	0.4446	Non-Significant Effect				
Error	0.0044556		0.000557	8							
Total	0.0048156			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	0.9993	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.899	0.741	0.2113	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.065	0.052	0.11	0.0106	32.41%	0.00%
31243-101		5	0.0608	0.0315	0.0901	0.058	0.037	0.087	0.0106	38.82%	16.48%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.081	0.065	0.056	0.11	0.052					
31243-101		0.039	0.087	0.083	0.037	0.058					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 12 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 13-1652-7153		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed chromium				33.17%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.108	1.86	0.024	8	CDF	0.5416	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.92	2.29	0.3214	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0000049		0.0000049	1	0.0116	0.9168	Non-Significant Effect				
Error	0.003372		0.0004215	8							
Total	0.0033769			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.94	23.2	0.5354	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.952	0.741	0.6919	Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.065	0.052	0.11	0.0106	32.41%	0.00%
31243-102		5	0.0714	0.0504	0.0924	0.074	0.047	0.094	0.00757	23.70%	1.92%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.081	0.065	0.056	0.11	0.052					
31243-102		0.047	0.074	0.075	0.067	0.094					

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Report Date: 07 Feb-19 08:44 (p 13 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 14-3376-6970		Endpoint: Chromium		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed chromium				31.99%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-0.751	1.86	0.023	8	CDF	0.7628	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.99	2.29	0.2414	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0002209	0.0002209	1	0.564	0.4743	Non-Significant Effect					
Error	0.003136	0.000392	8								
Total	0.0033569		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.45	23.2	0.4069	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.937	0.741	0.5233	Normal Distribution						
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.065	0.052	0.11	0.0106	32.41%	0.00%
31243-103		5	0.0634	0.0447	0.0821	0.063	0.042	0.08	0.00674	23.78%	12.91%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.081	0.065	0.056	0.11	0.052					
31243-103		0.042	0.063	0.075	0.08	0.057					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 14 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 18-5452-5382		Endpoint: Chromium			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed chromium				33.34%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.352	1.86	0.024	8	CDF	0.3668	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.91	2.29	0.3341		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.0000529		0.0000529	1	0.124	0.7336		Non-Significant Effect			
Error	0.003408		0.000426	8							
Total	0.0034609			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			1.89	23.2	0.5542		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.972	0.741	0.9093		Normal Distribution			
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.065	0.052	0.11	0.0106	32.41%	0.00%
31243-104		5	0.0774	0.0561	0.0987	0.081	0.05	0.097	0.00769	22.20%	-6.32%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.081	0.065	0.056	0.11	0.052					
31243-104		0.083	0.097	0.05	0.076	0.081					

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Report Date: 07 Feb-19 08:44 (p 15 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-6138-4604		Endpoint: Chromium		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed chromium			28.63%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.589	1.86	0.021	8	CDF	0.2861	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.23	2.29	0.0748		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0001089		0.0001089	1	0.347	0.5722	Non-Significant Effect				
Error	0.002512		0.000314	8							
Total	0.0026209			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		7.81	23.2	0.0715		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.904	0.741	0.2394		Normal Distribution				
Chromium Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.0728	0.0435	0.102	0.065	0.052	0.11	0.0106	32.41%	0.00%
31243-105		5	0.0794	0.0689	0.0899	0.075	0.072	0.09	0.00378	10.63%	-9.07%
Chromium Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.081	0.065	0.056	0.11	0.052					
31243-105		0.072	0.073	0.075	0.09	0.087					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 16 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-9115-2817		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed copper				13.26%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-2.97	1.86	0.156	8	CDF	0.9911	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.51	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.15625		0.15625	1	8.83	0.0178	Significant Effect				
Error	0.1416		0.0177	8							
Total	0.29785			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.06	23.2	0.2037	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.94	0.741	0.5550	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.18	1.08	1.28	1.2	1.1	1.3	0.0374	7.09%	0.00%
31243-101		5	0.93	0.721	1.14	0.92	0.74	1.1	0.0754	18.12%	21.19%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.3	1.1	1.2	1.1	1.2					
31243-101		0.79	1.1	1.1	0.74	0.92					

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Report Date: 07 Feb-19 08:44 (p 17 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.					
Analysis ID: 18-3116-3252		Endpoint: Copper		CETIS Version: CETISv1.9.3								
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu						
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL									
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C < T	31243-102 passed copper	11.67%									
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-102	-1.32	1.86	0.138	8	CDF	0.8889	Non-Significant Effect			
Auxiliary Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	1.97	2.29	0.2603	No Outliers Detected							
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.02401	0.02401	1	1.75	0.2223	Non-Significant Effect						
Error	0.10968	0.01371	8									
Total	0.13369		9									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	2.92	23.2	0.3245	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.928	0.741	0.4277	Normal Distribution							
Copper Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	1.18	1.08	1.28	1.2	1.1	1.3	0.0374	7.09%	0.00%	
31243-102		5	1.08	0.905	1.26	1.1	0.93	1.3	0.0639	13.21%	8.31%	
Copper Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	1.3	1.1	1.2	1.1	1.2						
31243-102		1.1	0.93	0.98	1.3	1.1						

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 18 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.					
Analysis ID: 05-2101-4778		Endpoint: Copper		CETIS Version: CETISv1.9.3								
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu						
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL									
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)									
Data Transform	Alt Hyp	Comparison Result				PMSD						
Untransformed	C < T	31243-103 passed copper				9.59%						
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		31243-103	0.753	1.89	0.113	7	CDF	0.2379	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.0045	0.0045	1	0.568	0.4758	Non-Significant Effect						
Error	0.0555	0.0079286	7									
Total	0.06		8									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	1.31	24.3	0.7745	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.949	0.701	0.6775	Normal Distribution							
Copper Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31242-008	RS	5	1.18	1.08	1.28	1.2	1.1	1.3	0.0374	7.09%	0.00%	
31243-103		4	1.22	1.07	1.38	1.25	1.1	1.3	0.0479	7.82%	-3.81%	
Copper Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31242-008	RS	1.3	1.1	1.2	1.1	1.2						
31243-103		Outlier	1.3	1.2	1.3	1.1						

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Report Date: 07 Feb-19 08:44 (p 19 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 20-5630-3518		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed copper					9.76%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-1.19	1.86	0.115	8	CDF	0.8668	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.91	2.29	0.3411	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01369	0.01369	1	1.43	0.2664	Non-Significant Effect					
Error	0.07672	0.00959	8								
Total	0.09041		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.74	23.2	0.6047	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.94	0.741	0.5566	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.18	1.08	1.28	1.2	1.1	1.3	0.0374	7.09%	0.00%
31243-104		5	1.11	0.969	1.24	1.1	0.93	1.2	0.0494	9.98%	6.27%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.3	1.1	1.2	1.1	1.2					
31243-104		1.1	1.2	0.93	1.1	1.2					

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Report Date: 07 Feb-19 08:44 (p 20 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-6651-2107		Endpoint: Copper			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 failed copper					15.28%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	2.27	1.86	0.18	8	CDF	0.0265	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.08	2.29	0.1668	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.121	0.121	1	5.15	0.0530	Non-Significant Effect					
Error	0.188	0.0235	8								
Total	0.309		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.71	23.2	0.1199	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.931	0.741	0.4589	Normal Distribution				
Copper Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.18	1.08	1.28	1.2	1.1	1.3	0.0374	7.09%	0.00%
31243-105		5	1.4	1.15	1.65	1.3	1.2	1.7	0.0894	14.29%	-18.64%
Copper Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.3	1.1	1.2	1.1	1.2					
31243-105		1.7	1.5	1.2	1.3	1.3					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 21 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 15-6875-4498		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed lead	21.77%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.201	1.86	0.037	8	CDF	0.5771	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.22	2.29	0.0756	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.000E-05	4.000E-05	1	0.0404	0.8457	Non-Significant Effect					
Error	0.00792	0.00099	8								
Total	0.00796		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	18.8	23.2	0.0148	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.893	0.741	0.1810	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-101		5	0.166	0.112	0.22	0.16	0.1	0.21	0.0194	26.12%	2.35%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-101		0.1	0.2	0.16	0.16	0.21					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 22 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 00-1686-6927		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed lead	39.54%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.698	2.13	0.067	4	CDF	0.2619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.3	2.29	0.0474	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00121	0.00121	1	0.487	0.5051	Non-Significant Effect					
Error	0.01988	0.002485	8								
Total	0.02109		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	48.7	23.2	0.0024	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.842	0.741	0.0470	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-102		5	0.192	0.105	0.279	0.19	0.11	0.3	0.0312	36.35%	-12.94%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-102		0.3	0.2	0.11	0.19	0.16					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 23 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 08-6320-2064		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed lead				20.57%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.271	1.89	0.035	7	CDF	0.6029	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.556E-05	5.556E-05	1	0.0734	0.7943	Non-Significant Effect					
Error	0.0053	0.0007571	7								
Total	0.0053556		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	16.3	24.3	0.0208	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.917	0.701	0.3691	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-102		4	0.165	0.101	0.229	0.175	0.11	0.2	0.0202	24.49%	2.94%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-102		Outlier	0.2	0.11	0.19	0.16					

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Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-0575-9466		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed lead	18.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0	1.86	0.032	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.94	2.29	0.3036	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.006	0.00075	8								
Total	0.006		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	14	23.2	0.0255	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.936	0.741	0.5048	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-103		5	0.17	0.124	0.216	0.19	0.12	0.2	0.0167	22.01%	0.00%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-103		0.12	0.19	0.14	0.2	0.2					

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Report Date: 07 Feb-19 08:44 (p 25 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 07-0519-8133		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed lead			7.42%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-5.31	1.86	0.013	8	CDF	0.9996	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.58	2.29	0.9510	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00324	0.00324	1	28.2	7.2E-04	Significant Effect					
Error	0.0009200	0.000115	8								
Total	0.00416		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.3	23.2	0.8055	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.944	0.741	0.5954	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-104		5	0.134	0.12	0.148	0.13	0.12	0.15	0.0051	8.51%	21.18%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-104		0.13	0.13	0.14	0.12	0.15					

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Report Date: 07 Feb-19 08:44 (p 26 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 21-0298-5795		Endpoint: Lead		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed lead				16.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-1.44	1.86	0.028	8	CDF	0.9058	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1449	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00121	0.00121	1	2.07	0.1883	Non-Significant Effect					
Error	0.00468	0.000585	8								
Total	0.00589		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	10.7	23.2	0.0413	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.915	0.741	0.3194	Normal Distribution						
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.17	0.158	0.182	0.17	0.16	0.18	0.00447	5.88%	0.00%
31243-105		5	0.148	0.107	0.189	0.15	0.1	0.19	0.0146	22.10%	12.94%
Lead Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.16	0.17	0.18	0.16	0.18					
31243-105		0.19	0.16	0.1	0.15	0.14					

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Report Date: 07 Feb-19 08:44 (p 27 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 16-4273-9343		Endpoint: Mercury		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed mercury			8.74%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	3.06E-07	1.86	0.0001	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.59	2.29	0.9435	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.388E-21	3.388E-21	1	2.34E-13	1.0000	Non-Significant Effect					
Error	1.16E-07	1.45E-08	8								
Total	1.16E-07		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.42	23.2	0.7439	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.848	0.741	0.0553	Normal Distribution						
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0016	0.0015	0.0018	0.000049	6.76%	0.00%
31243-101		5	0.00162	0.00146	0.00178	0.0016	0.0015	0.0018	5.83E-05	8.05%	0.00%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016					
31243-101		0.0017	0.0016	0.0015	0.0018	0.0015					

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Report Date: 07 Feb-19 08:44 (p 28 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 07-8095-7860		Endpoint: Mercury		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 failed mercury	179.09%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	2.37	2.13	0.003	4	CDF	0.0386	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.6	2.29	0.9145	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.592E-05	2.592E-05	1	5.6	0.0455	Significant Effect					
Error	3.704E-05	4.63E-06	8								
Total	6.296E-05		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	771	23.2	1.0E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.741	0.1773	Normal Distribution						
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0016	0.0015	0.0018	0.000049	6.76%	0.00%
31243-102		5	0.00484	0.00106	0.00862	0.006	0.0016	0.008	0.00136	62.83%	-198.77%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016					
31243-102		0.0016	0.0016	0.008	0.006	0.007					

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Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 02-0648-0266		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed mercury				141.78%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.88	2.13	0.002	4	CDF	0.0226	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.04	2.29	0.1947		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	2.403E-05		2.403E-05	1	8.28	0.0206		Significant Effect			
Error	2.322E-05		2.902E-06	8							
Total	4.724E-05			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			483	23.2	2.6E-05		Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.886	0.741	0.1521		Normal Distribution			
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0016	0.0015	0.0018	0.000049	6.76%	0.00%
31243-103		5	0.00472	0.00173	0.00771	0.004	0.0016	0.008	0.00108	50.99%	-191.36%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016					
31243-103		0.0016	0.006	0.004	0.008	0.004					

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Report Date: 07 Feb-19 08:44 (p 30 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 07-7178-6438		Endpoint: Mercury		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 failed mercury				134.36%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	5.47	2.13	0.002	4	CDF	0.0027	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1466	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	7.784E-05	7.784E-05	1	29.9	6.0E-04	Significant Effect					
Error	2.085E-05	2.606E-06	8								
Total	9.869E-05		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	433	23.2	3.2E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.896	0.741	0.1979	Normal Distribution						
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0016	0.0015	0.0018	0.000049	6.76%	0.00%
31243-104		5	0.0072	0.00437	0.01	0.008	0.004	0.01	0.00102	31.67%	-344.44%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016					
31243-104		0.008	0.008	0.004	0.006	0.01					

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Report Date: 07 Feb-19 08:44 (p 31 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 18-1980-9582		Endpoint: Mercury			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed mercury				59.20%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	16.4	2.13	0.001	4	CDF	4.0E-05	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.0001362		0.0001362	1	269	1.9E-07		Significant Effect			
Error	4.048E-06		5.06E-07	8							
Total	0.0001402			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			83.3	23.2	8.4E-04		Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.866	0.741	0.0893		Normal Distribution			
Mercury Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.00162	0.00148	0.00176	0.0016	0.0015	0.0018	0.000049	6.76%	0.00%
31243-105		5	0.009	0.00776	0.0102	0.009	0.008	0.01	0.000447	11.11%	-455.56%
Mercury Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.0016	0.0016	0.0018	0.0015	0.0016					
31243-105		0.01	0.008	0.009	0.01	0.008					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 32 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 06-2406-3040		Endpoint: Nickel			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed nickel			20.93%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-1.43	1.86	0.026	8	CDF	0.9043	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.84	2.29	0.4387		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0009604		0.0009604	1	2.04	0.1913	Non-Significant Effect				
Error	0.0037712		0.0004714	8							
Total	0.0047316			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.95	23.2	0.5348	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.967	0.741	0.8628	Normal Distribution					
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.12	0.1	0.14	0.008	14.66%	0.00%
31243-101		5	0.102	0.0714	0.133	0.1	0.074	0.14	0.0112	24.37%	16.07%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.14	0.12	0.11	0.14	0.1					
31243-101		0.074	0.1	0.14	0.088	0.11					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-6440-5864		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed nickel	14.46%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.843	1.86	0.018	8	CDF	0.7882	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.56	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	0.711	0.4236	Non-Significant Effect					
Error	0.0018	0.000225	8								
Total	0.00196		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.46	23.2	0.4043	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.924	0.741	0.3928	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.12	0.1	0.14	0.008	14.66%	0.00%
31243-102		5	0.114	0.0998	0.128	0.11	0.1	0.13	0.0051	10.00%	6.56%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.14	0.12	0.11	0.14	0.1					
31243-102		0.1	0.13	0.11	0.11	0.12					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 12-4844-1242		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed nickel	21.45%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0.711	1.86	0.026	8	CDF	0.2487	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.53	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	0.505	0.4975	Non-Significant Effect					
Error	0.00396	0.000495	8								
Total	0.00421		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.09	23.2	0.4918	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.916	0.741	0.3278	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.12	0.1	0.14	0.008	14.66%	0.00%
31243-103		5	0.132	0.0999	0.164	0.14	0.1	0.16	0.0116	19.61%	-8.20%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.14	0.12	0.11	0.14	0.1					
31243-103		0.1	0.14	0.16	0.15	0.11					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 08-6608-9382		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed nickel	20.67%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	-0.354	1.86	0.025	8	CDF	0.6338	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.04	2.29	0.1981	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.760E-05	5.760E-05	1	0.125	0.7325	Non-Significant Effect					
Error	0.0036768	0.0004596	8								
Total	0.0037344		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.87	23.2	0.5584	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.919	0.741	0.3475	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.12	0.1	0.14	0.008	14.66%	0.00%
31243-104		5	0.117	0.0868	0.148	0.12	0.076	0.14	0.0109	20.89%	3.93%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.14	0.12	0.11	0.14	0.1					
31243-104		0.14	0.13	0.076	0.12	0.12					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 02-8426-6158		Endpoint: Nickel		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed nickel	38.56%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	1.34	1.86	0.047	8	CDF	0.1079	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.49	2.29	0.0089	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00289	0.00289	1	1.81	0.2158	Non-Significant Effect					
Error	0.0128	0.0016	8								
Total	0.01569		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	9	23.2	0.0560	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.8	0.741	0.0144	Normal Distribution						
Nickel Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.122	0.0998	0.144	0.12	0.1	0.14	0.008	14.66%	0.00%
31243-105		5	0.156	0.0894	0.223	0.13	0.12	0.25	0.024	34.40%	-27.87%
Nickel Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.14	0.12	0.11	0.14	0.1					
31243-105		0.25	0.15	0.12	0.13	0.13					

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Bioaccumulation Evaluation - Metals - Nereis virens										EnviroSystems, Inc.	
Analysis ID: 17-2350-8699		Endpoint: Zinc			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:42		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed zinc					100.13%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	33	n/a	0	8	Exact	0.8889	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.3	2.29	0.0471	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.324	0.324	1	0.00409	0.9506	Non-Significant Effect					
Error	634.492	79.3115	8								
Total	634.816		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.8	23.2	0.3430	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.706	0.741	0.0011	Non-Normal Distribution				
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-101		5	10.1	-3.32	23.5	5.4	4.5	29.4	4.83	107.03%	3.44%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-101		4.9	6.3	29.4	4.5	5.4					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 13-3467-8356		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:42		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed zinc				59.43%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-1.78	2.13	6.22	4	CDF	0.9250	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	59.7427	59.7427	1	2.48	0.1596	Non-Significant Effect					
Error	168.88	24.1256	7								
Total	228.622		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	69.3	46.2	0.0055	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.896	0.701	0.2289	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-101		4	5.28	4.04	6.51	5.15	4.5	6.3	0.388	14.71%	49.57%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-101		4.9	6.3	Outlier	4.5	5.4					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 08-8093-1435		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed zinc				59.22%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-1.3	2.13	6.19	4	CDF	0.8684	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.25	2.29	0.0654	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	35.721	35.721	1	1.69	0.2295	Non-Significant Effect					
Error	168.88	21.11	8								
Total	204.601		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	92.4	23.2	6.8E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.887	0.741	0.1588	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-102		5	6.68	5.85	7.51	6.8	5.9	7.5	0.301	10.06%	36.14%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-102		7.1	5.9	6.1	7.5	6.8					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 05-1603-5130		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed zinc	76.06%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	0.0561	1.86	7.96	8	CDF	0.4783	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.82	2.29	0.4670	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.144	0.144	1	0.00315	0.9566	Non-Significant Effect					
Error	366.132	45.7665	8								
Total	366.276		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.19	23.2	0.8693	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.821	0.741	0.0260	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-103		5	10.7	1.94	19.5	7.2	4.7	22.3	3.15	65.93%	-2.29%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-103		4.7	22.3	7.2	7	12.3					

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Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 16-8581-7927		Endpoint: Zinc		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed zinc	91.81%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.608	1.86	9.6	8	CDF	0.2800	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.73	2.29	0.6273	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	24.649	24.649	1	0.37	0.5600	Non-Significant Effect					
Error	533.352	66.669	8								
Total	558.001		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.19	23.2	0.4658	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.838	0.741	0.0423	Normal Distribution						
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-104		5	13.6	1.72	25.5	7.2	6.5	26.9	4.28	70.36%	-30.02%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-104		7.2	6.7	26.9	6.5	20.7					

CETIS Analytical Report

Report Date: 07 Feb-19 08:44 (p 42 of 42)
Test Code: 31250Nv-Met | 20-6215-6556

Bioaccumulation Evaluation - Metals - Nereis virens							EnviroSystems, Inc.				
Analysis ID: 18-0355-3687		Endpoint: Zinc			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:43		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed zinc			100.19%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.649	1.86	10.5	8	CDF	0.2671	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.2	2.29	0.0875		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	33.489		33.489	1	0.422	0.5342	Non-Significant Effect				
Error	635.18		79.3975	8							
Total	668.669			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.8	23.2	0.3423		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.816	0.741	0.0224		Normal Distribution				
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	10.5	2.44	18.5	6.8	5.6	20.2	2.89	61.79%	0.00%
31243-105		5	14.1	0.688	27.6	8.1	6.9	32.6	4.84	76.61%	-34.99%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	14	20.2	5.6	5.7	6.8					
31243-105		8.1	8	32.6	6.9	15					

Nereis virens
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
PAHs

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
PAHs (ng/g wet weight)						
Acenaphthene	2.4	U	2.4	U	9.9	
Acenaphthylene	2.4	U	2.4	U	2.3	U
Anthracene	2.4	U	2.4	U	2.3	U
Benzo(a)anthracene	2.4	U	2.4	U	2.3	U
Benzo(a)pyrene	2.4	U	2.4	U	2.3	U
Benzo(b)fluoranthene	2.4	U	2.4	U	2.3	U
Benzo(k)fluoranthene	2.4	U	2.4	U	2.3	U
Benzo(g,h,i)perylene	2.4	U	2.4	U	2.3	U
Chrysene	2.4	U	2.4	U	2.3	U
Dibenzo(a,h)anthracene	2.4	U	2.4	U	2.3	U
Fluoranthene	5.5	J	2.4	U	2.3	U
Fluorene	2.4	U	2.4	U	2.3	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.4	U	2.3	U
Naphthalene	2.4	U	2.4	U	2.3	U
Phenanthrene	5.5	J	2.4	U	2.3	U
Pyrene	4.9	J	2.4	U	2.3	U
PAH Total	47		38		45	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Acenaphthylene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Anthracene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Benzo(a)anthracene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Benzo(a)pyrene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Benzo(b)fluoranthene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Benzo(k)fluoranthene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Benzo(g,h,i)perylene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Chrysene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Dibenzo(a,h)anthracene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Fluoranthene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Fluorene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Naphthalene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Phenanthrene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
Pyrene	2.3	U	2.2	U	2.4	U	2.4	U	2.4	U
PAH Total	36		34		38		38		38	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Acenaphthylene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Anthracene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Benzo(a)anthracene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Benzo(a)pyrene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Benzo(b)fluoranthene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Benzo(k)fluoranthene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Benzo(g,h,i)perylene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Chrysene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Dibenzo(a,h)anthracene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Fluoranthene	4.5	J	6.6	J	6.1	J	2.2	U	2.4	U
Fluorene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Naphthalene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Phenanthrene	2.2	U	2.2	U	2.5	U	2.2	U	2.4	U
Pyrene	2.2	U	5.1	J	2.5	U	2.2	U	2.4	U
PAH Total	37		42		43		35		39	

* = Qualifiers

U Analyte not detected; below the Method Detection Limit

J Analyte estimated; detection below Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Acenaphthylene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Anthracene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Benzo(a)anthracene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Benzo(a)pyrene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Benzo(b)fluoranthene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Benzo(k)fluoranthene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Benzo(g,h,i)perylene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Chrysene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Dibenzo(a,h)anthracene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Fluoranthene	10		8.8	J	6.6	J	6.5	J	2.4	U
Fluorene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Naphthalene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Phenanthrene	2.2	U	2.4	U	2.2	U	2.5	U	2.4	U
Pyrene	7.2	J	6.2	J	5.0	J	2.5	U	2.4	U
PAH Total	49		49		42		44		38	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Acenaphthylene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Anthracene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Benzo(a)anthracene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Benzo(a)pyrene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Benzo(b)fluoranthene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Benzo(k)fluoranthene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Benzo(g,h,i)perylene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Chrysene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Dibenzo(a,h)anthracene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Fluoranthene	7.3	J	5.2	J	9.9		2.3	U	10	
Fluorene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Indeno(1,2,3-c,d)pyrene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Naphthalene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Phenanthrene	2.2	U	2.3	U	2.2	U	2.3	U	2.2	U
Pyrene	6.4	J	2.3	U	7.1	J	2.3	U	7.6	J
PAH Total	45		39		48		37		49	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Acenaphthylene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Anthracene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Benzo(a)anthracene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Benzo(a)pyrene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Benzo(b)fluoranthene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Benzo(k)fluoranthene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Benzo(g,h,i)perylene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Chrysene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Dibenzo(a,h)anthracene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Fluoranthene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Fluorene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Naphthalene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Phenanthrene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
Pyrene	2.4	U	2.3	U	2.4	U	2.4	U	2.4	U
PAH Total	39		37		38		39		38	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PAHs (ng/g wet weight)										
Acenaphthene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Acenaphthylene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Anthracene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Benzo(a)anthracene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Benzo(a)pyrene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Benzo(b)fluoranthene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Benzo(k)fluoranthene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Benzo(g,h,i)perylene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Chrysene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Dibenzo(a,h)anthracene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Fluoranthene	5.0	J	6.9	J	4.6	J	8.0	J	5.7	J
Fluorene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Indeno(1,2,3-c,d)pyrene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Naphthalene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Phenanthrene	2.4	U	2.4	U	2.3	U	2.3	U	2.3	U
Pyrene	7.6	J	9.7		6.6	J	10		7.5	J
PAH Total	46		50		43		50		46	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:13 (p 1 of 2)

Test Code/ID: 19-4111-8504/31250Nv-PAH

Bioaccumulation Evaluation - PAHs - Nereis EnviroSystems, Inc.

Start Date: 20 Nov-18 12:02 **Species:** Nereis virens **Sample Code:** 31250-000
End Date: 18 Dec-18 12:02 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 20 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Nv)

Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenze	Total PAHs
31242-008	1	2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
31242-008	2	11	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
31242-008	3	13	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31242-008	4	21	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31242-008	5	30	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-101	1	1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	4.5	2.2	2.2	2.2	2.2	2.2		
31243-101	2	7	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	6.6	2.2	2.2	2.2	2.2	5.1		
31243-101	3	18	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	6.1	2.5	2.5	2.5	2.5	2.5		
31243-101	4	20	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
31243-101	5	26	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-102	1	5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	10	2.2	2.2	2.2	2.2	7.2		
31243-102	2	8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	8.8	2.4	2.4	2.4	2.4	6.2		
31243-102	3	17	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	6.6	2.2	2.2	2.2	2.2	5		
31243-102	4	23	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	6.5	2.5	2.5	2.5	2.5	2.5		
31243-102	5	25	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-103	1	4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	7.3	2.2	2.2	2.2	2.2	6.4		
31243-103	2	10	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	5.2	2.3	2.3	2.3	2.3	2.3		
31243-103	3	16	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	9.9	2.2	2.2	2.2	2.2	7.1		
31243-103	4	22	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
31243-103	5	28	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	10	2.2	2.2	2.2	2.2	7.6		
31243-104	1	3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-104	2	9	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
31243-104	3	14	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-104	4	19	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-104	5	27	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4		
31243-105	1	6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	5	2.4	2.4	2.4	2.4	7.6		
31243-105	2	12	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	6.9	2.4	2.4	2.4	2.4	9.7		

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:13 (p 2 of 2)

Test Code/ID: 19-4111-8504/31250Nv-PAH

Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenzene	Total PAHs
31243-105	3	15	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.6	2.3	2.3	2.3	2.3	6.6		
31243-105	4	24	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	8	2.3	2.3	2.3	2.3	10		
31243-105	5	29	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	5.7	2.3	2.3	2.3	2.3	7.5		

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 1 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis **EnviroSystems, Inc.**

Batch ID: 09-2412-6295	Test Type: Bioaccumulation - PAHs	Analyst: Nancy Roka
Start Date: 20 Nov-18 12:02	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 18 Dec-18 12:02	Species: Nereis virens	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
11-9665-6021	Acenaphthene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed acenaphthene
07-6192-8737	Acenaphthene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed acenaphthene
07-0836-8009	Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed acenaphthene
12-1788-0916	Acenaphthene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed acenaphthene
07-4413-2322	Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed acenaphthene
17-2159-2510	Acenaphthylene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed acenaphthylene
03-2529-9915	Acenaphthylene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed acenaphthylene
14-4723-1047	Acenaphthylene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed acenaphthylene
04-2526-6563	Acenaphthylene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed acenaphthylene
10-0121-1132	Acenaphthylene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed acenaphthylene
00-5132-6343	Anthracene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed anthracene
02-7320-2909	Anthracene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed anthracene
17-2962-3544	Anthracene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed anthracene
00-0555-5440	Anthracene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed anthracene
15-8732-4772	Anthracene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed anthracene
06-8344-3433	Benzo(a)anthracene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed benzo(a)anthracene
13-9538-2528	Benzo(a)anthracene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed benzo(a)anthracene
03-4041-8400	Benzo(a)anthracene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed benzo(a)anthracene
04-6928-9272	Benzo(a)anthracene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed benzo(a)anthracene
06-7392-5123	Benzo(a)anthracene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed benzo(a)anthracene
11-3036-3519	Benzo(a)pyrene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed benzo(a)pyrene
09-3219-3319	Benzo(a)pyrene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed benzo(a)pyrene
16-0004-4814	Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed benzo(a)pyrene
17-1353-1657	Benzo(a)pyrene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed benzo(a)pyrene
06-6171-5377	Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed benzo(a)pyrene
00-1429-0677	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed benzo(b)fluoranthene
12-8372-5694	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed benzo(b)fluoranthene
05-8437-3471	Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed benzo(b)fluoranthene
08-0060-6203	Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed benzo(b)fluoranthene
20-8336-4888	Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed benzo(b)fluoranthene
16-2647-8037	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed benzo(g,h,i)perylene
20-7389-5897	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed benzo(g,h,i)perylene
18-9826-8440	Benzo(g,h,i)perylene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed benzo(g,h,i)perylene

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 2 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
21-1612-2308	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed benzo(g,h,i)perylene
10-5125-4621	Benzo(g,h,i)perylene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed benzo(g,h,i)perylene
02-2173-7057	Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed benzo(k)fluoranthene
05-7914-6075	Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed benzo(k)fluoranthene
10-3779-5250	Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed benzo(k)fluoranthene
04-4336-0151	Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed benzo(k)fluoranthene
14-5794-5255	Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed benzo(k)fluoranthene
20-5645-4137	Chrysene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed chrysene
15-3895-8292	Chrysene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed chrysene
04-9154-8922	Chrysene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed chrysene
01-4970-8907	Chrysene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed chrysene
07-8515-4298	Chrysene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed chrysene
19-9708-7928	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed dibenz(a,h)anthracene
05-8815-2917	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed dibenz(a,h)anthracene
06-4240-9278	Dibenz(a,h)anthracene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed dibenz(a,h)anthracene
17-4231-5375	Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed dibenz(a,h)anthracene
00-2515-8859	Dibenz(a,h)anthracene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed dibenz(a,h)anthracene
20-8939-5577	Fluoranthene	Unequal Variance t Two-Sample Test	0.0455	31243-101 failed fluoranthene
09-1889-8287	Fluoranthene	Unequal Variance t Two-Sample Test	0.0036	31243-102 failed fluoranthene
18-2243-8727	Fluoranthene	Unequal Variance t Two-Sample Test	0.0127	31243-102 failed fluoranthene
19-3869-2219	Fluoranthene	Unequal Variance t Two-Sample Test	0.0174	31243-103 failed fluoranthene
00-8566-4975	Fluoranthene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed fluoranthene
01-6906-3541	Fluoranthene	Unequal Variance t Two-Sample Test	0.0021	31243-105 failed fluoranthene
15-1459-0497	Fluorene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed fluorene
02-9241-4733	Fluorene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed fluorene
09-3100-2282	Fluorene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed fluorene
17-3552-4991	Fluorene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed fluorene
12-4123-0949	Fluorene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed fluorene
00-5437-0629	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed indeno(1,2,3-cd)pyrene
09-7419-7339	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed indeno(1,2,3-cd)pyrene
16-5762-8097	Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed indeno(1,2,3-cd)pyrene
11-5754-1449	Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed indeno(1,2,3-cd)pyrene
15-0022-9335	Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed indeno(1,2,3-cd)pyrene
16-1692-6850	Naphthalene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed naphthalene
04-2995-2727	Naphthalene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed naphthalene
12-0962-8112	Naphthalene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed naphthalene
14-7513-6801	Naphthalene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed naphthalene
05-2247-2850	Naphthalene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed naphthalene
08-3186-5631	Phenanthrene	Equal Variance t Two-Sample Test	0.6962	31243-101 passed phenanthrene
12-3981-9690	Phenanthrene	Equal Variance t Two-Sample Test	0.5000	31243-102 passed phenanthrene
14-4179-7054	Phenanthrene	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed phenanthrene
13-2865-5228	Phenanthrene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed phenanthrene
01-7720-5808	Phenanthrene	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed phenanthrene
01-4289-3386	Pyrene	Equal Variance t Two-Sample Test	0.5717	31243-101 passed pyrene
18-7891-2478	Pyrene	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-101 passed pyrene
10-4209-7979	Pyrene	Unequal Variance t Two-Sample Test	0.0373	31243-102 failed pyrene
01-5318-6439	Pyrene	Unequal Variance t Two-Sample Test	0.0379	31243-103 failed pyrene
09-1966-4873	Pyrene	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pyrene
10-4299-4260	Pyrene	Unequal Variance t Two-Sample Test	4.4E-04	31243-105 failed pyrene

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 3 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis											EnviroSystems, Inc.
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 4 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis											EnviroSystems, Inc.
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	4.36	1.83	6.89	2.2	6.6	0.91	2.04	46.68%	-86.32%
31243-102		5	6.86	3.26	10.5	2.4	10	1.3	2.9	42.32%	-193.16%
31243-103		5	6.94	2.88	11	2.3	10	1.46	3.27	47.14%	-196.58%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	6.04	4.3	7.78	4.6	8	0.627	1.4	23.20%	-158.12%
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 5 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis											EnviroSystems, Inc.
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.5	0.0632	0.141	6.15%	1.71%
31243-102		5	2.34	2.17	2.51	2.2	2.5	0.06	0.134	5.73%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.3	0.0245	0.0548	2.45%	4.27%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	2.34	2.27	2.41	2.3	2.4	0.0245	0.0548	2.34%	0.00%
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.2	2.4	0.04	0.0894	3.82%	0.00%
31243-101		5	2.88	1.33	4.43	2.2	5.1	0.558	1.25	43.33%	-23.08%
31243-102		5	4.66	1.97	7.35	2.4	7.2	0.967	2.16	46.41%	-99.15%
31243-103		5	5.14	1.88	8.4	2.3	7.6	1.17	2.63	51.12%	-119.66%
31243-104		5	2.38	2.32	2.44	2.3	2.4	0.02	0.0447	1.88%	-1.71%
31243-105		5	8.28	6.43	10.1	6.6	10	0.666	1.49	17.98%	-253.85%

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 6 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.
Acenaphthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Acenaphthylene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Benzo(a)anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Benzo(a)pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Benzo(b)fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 7 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.
Benzo(g,h,i)perylene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Benzo(k)fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Chrysene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Dibenz(a,h)anthracene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Fluoranthene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		4.5	6.6	6.1	2.2	2.4	
31243-102		10	8.8	6.6	6.5	2.4	
31243-103		7.3	5.2	9.9	2.3	10	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		5	6.9	4.6	8	5.7	
Fluorene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	

CETIS Summary Report

Report Date: 07 Feb-19 08:49 (p 8 of 8)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.
Indeno(1,2,3-cd)pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Naphthalene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Phenanthrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	2.2	2.5	2.2	2.4	
31243-102		2.2	2.4	2.2	2.5	2.4	
31243-103		2.2	2.3	2.2	2.3	2.2	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		2.4	2.4	2.3	2.3	2.3	
Pyrene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	2.2	2.4	2.4	2.4	
31243-101		2.2	5.1	2.5	2.2	2.4	
31243-102		7.2	6.2	5	2.5	2.4	
31243-103		6.4	2.3	7.1	2.3	7.6	
31243-104		2.4	2.3	2.4	2.4	2.4	
31243-105		7.6	9.7	6.6	10	7.5	

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Benzo(a)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	2.216971	2.13185	0.045459	0.05	TRUE	1.942439	4		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345226	1.85955	0.6962444	0.05	FALSE	0.1391558	8		C
Pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	25.5		0.3452381	0.05	FALSE		8	2	E
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1875524	1.89458	0.5717259	0.05	FALSE	0.151524	7		C
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Benzo(a)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	3.479807	2.13185	0.0126782	0.05	TRUE	2.769104	4		C
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	6.555465	2.35336	0.0036091	0.05	TRUE	2.022923	3		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.1340939	8		C
Pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	2.396469	2.13185	0.0373209	0.05	TRUE	2.063821	4		C
Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Acenaphthylene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Benzo(a)anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Benzo(g,h,i)perylene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Chrysene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Dibenz(a,h)anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	3.14288	2.13185	0.0173756	0.05	TRUE	3.120226	4		C
Fluorene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Naphthalene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Phenanthrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
Pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	2.381621	2.13185	0.0379277	0.05	TRUE	2.506348	4		C
Acenaphthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Acenaphthylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Benzo(a)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Benzo(a)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Chrysene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Fluoranthene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Fluorene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Naphthalene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Phenanthrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Pyrene	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944269	1.85955	0.198602	0.05	FALSE	0.08316156	8		C
Acenaphthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Acenaphthylene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Benzo(a)anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Benzo(a)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Benzo(g,h,i)perylene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Chrysene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Dibenz(a,h)anthracene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Fluoranthene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	5.893094	2.13185	0.0020733	0.05	TRUE	1.338488	4		C
Fluorene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Naphthalene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Phenanthrene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
Pyrene	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	8.904436	2.13185	0.0004396	0.05	TRUE	1.422119	4		C

CETIS Analytical Report

Report Date: 07 Feb-19 08:48 (p 1 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-9665-6021		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed acenaphthene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

CETIS Analytical Report

Report Date: 07 Feb-19 08:48 (p 2 of 80)
 Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6192-8737		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed acenaphthene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Report Date: 07 Feb-19 08:48 (p 3 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-0836-8009		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed acenaphthene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Report Date: 07 Feb-19 08:48 (p 4 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-1788-0916		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed acenaphthene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Report Date: 07 Feb-19 08:48 (p 5 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-4413-2322		Endpoint: Acenaphthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed acenaphthene			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Acenaphthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Acenaphthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

CETIS Analytical Report

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2159-2510		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed acenaphthylene					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-2529-9915		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed acenaphthylene				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	14-4723-1047		Endpoint:	Acenaphthylene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 passed acenaphthylene					3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-2526-6563		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed acenaphthylene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-0121-1132		Endpoint: Acenaphthylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed acenaphthylene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1.421E-14		1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect				
Error	0.0440001		0.0055000	8							
Total	0.0440001			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Acenaphthylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Acenaphthylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-5132-6343		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed anthracene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-7320-2909		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed anthracene				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2962-3544		Endpoint: Anthracene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed anthracene			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-0555-5440		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed anthracene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-8732-4772		Endpoint: Anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed anthracene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-8344-3433		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed benzo(a)anthracene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.286	0.6075	Non-Significant Effect					
Error	0.112	0.014	8								
Total	0.116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Benzo(a)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Report Date: 07 Feb-19 08:48 (p 17 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-9538-2528		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed benzo(a)anthracene				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Benzo(a)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 03-4041-8400		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed benzo(a)anthracene				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Benzo(a)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-6928-9272		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(a)anthracene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Benzo(a)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-7392-5123		Endpoint: Benzo(a)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed benzo(a)anthracene					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Benzo(a)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Benzo(a)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

CETIS Analytical Report

Report Date: 07 Feb-19 08:48 (p 21 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-3036-3519		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed benzo(a)pyrene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Report Date: 07 Feb-19 08:48 (p 22 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-3219-3319		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed benzo(a)pyrene				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

CETIS Analytical Report

Report Date: 07 Feb-19 08:48 (p 23 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 16-0004-4814		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed benzo(a)pyrene				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-1353-1657		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(a)pyrene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Report Date: 07 Feb-19 08:48 (p 25 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-6171-5377		Endpoint: Benzo(a)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed benzo(a)pyrene				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
Benzo(a)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Benzo(a)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-1429-0677		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed benzo(b)fluoranthene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8372-5694		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed benzo(b)fluoranthene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-8437-3471		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed benzo(b)fluoranthene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-0060-6203		Endpoint: Benzo(b)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(b)fluoranthene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	20-8336-4888		Endpoint:	Benzo(b)fluoranthene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 passed benzo(b)fluoranthene					3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Benzo(b)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Benzo(b)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	16-2647-8037		Endpoint:	Benzo(g,h,i)perylene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Parametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-101 passed benzo(g,h,i)perylene					5.95%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.286	0.6075	Non-Significant Effect					
Error	0.112	0.014	8								
Total	0.116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-7389-5897		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed benzo(g,h,i)perylene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-9826-8440		Endpoint:	Benzo(g,h,i)perylene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 passed benzo(g,h,i)perylene					3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-1612-2308		Endpoint: Benzo(g,h,i)perylene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(g,h,i)perylene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-5125-4621		Endpoint: Benzo(g,h,i)perylene		CETIS Version: CETISv1.9.3						
Analyzed:	07 Feb-19 8:47		Analysis: Nonparametric-Two Sample		Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed benzo(g,h,i)perylene			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
Benzo(g,h,i)perylene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Benzo(g,h,i)perylene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-2173-7057		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed benzo(k)fluoranthene					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-7914-6075		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed benzo(k)fluoranthene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-3779-5250		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed benzo(k)fluoranthene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-4336-0151		Endpoint: Benzo(k)fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed benzo(k)fluoranthene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	14-5794-5255		Endpoint:	Benzo(k)fluoranthene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-105 passed benzo(k)fluoranthene					3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Benzo(k)fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Benzo(k)fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-5645-4137		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed chrysene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-3895-8292		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed chrysene				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-9154-8922		Endpoint: Chrysene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed chrysene	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-4970-8907		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed chrysene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-8515-4298		Endpoint: Chrysene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed chrysene					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1.421E-14		1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect				
Error	0.0440001		0.0055000	8							
Total	0.0440001			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Chrysene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Chrysene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-9708-7928		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed dibenz(a,h)anthracene					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-8815-2917		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed dibenz(a,h)anthracene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-4240-9278		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed dibenz(a,h)anthracene	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-4231-5375		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed dibenz(a,h)anthracene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-2515-8859		Endpoint: Dibenz(a,h)anthracene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed dibenz(a,h)anthracene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Dibenz(a,h)anthracene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Dibenz(a,h)anthracene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-8939-5577		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 failed fluoranthene				83.01%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.22	2.13	1.94	4	CDF	0.0455	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.65	2.29	0.7916	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	10.201		10.201	1	4.91	0.0575	Non-Significant Effect				
Error	16.604		2.0755	8							
Total	26.805			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			518	23.2	2.2E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.876	0.741	0.1174	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	4.36	1.83	6.89	4.5	2.2	6.6	0.91	46.68%	-86.32%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		4.5	6.6	6.1	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-1889-8287		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 failed fluoranthene				86.45%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	6.56	2.35	2.02	3	CDF	0.0036	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	70.5627		70.5627	1	55.6	1.4E-04	Significant Effect				
Error	8.8795		1.2685	7							
Total	79.4422			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			369	24.3	4.9E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.701	0.2375	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		4	7.98	5.24	10.7	7.7	6.5	10	0.859	21.53%	-240.81%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		10	8.8	6.6	6.5	Outlier					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 19-3869-2219		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 failed fluoranthene				133.34%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	3.14	2.13	3.12	4	CDF	0.0174	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.13	2.29	0.1299		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	52.9		52.9	1	9.88	0.0137		Significant Effect			
Error	42.844		5.3555	8							
Total	95.744		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		1340	23.2	3.3E-06		Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.864	0.741	0.0844		Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	6.94	2.88	11	7.3	2.3	10	1.46	47.14%	-196.58%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		7.3	5.2	9.9	2.3	10					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-8566-4975		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed fluoranthene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-6906-3541		Endpoint: Fluoranthene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 failed fluoranthene				57.20%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	5.89	2.13	1.34	4	CDF	0.0021	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.09	2.29	0.1527	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	34.225		34.225	1	34.7	3.6E-04	Significant Effect				
Error	7.884		0.9855	8							
Total	42.109			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			245	23.2	9.9E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.918	0.741	0.3390	Normal Distribution				
Fluoranthene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	6.04	4.3	7.78	5.7	4.6	8	0.627	23.20%	-158.12%
Fluoranthene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		5	6.9	4.6	8	5.7					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-1459-0497		Endpoint: Fluorene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed fluorene	5.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.286	0.6075	Non-Significant Effect					
Error	0.112	0.014	8								
Total	0.116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-9241-4733		Endpoint: Fluorene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed fluorene	5.73%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.25	23.2	0.4515	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0298	Normal Distribution						
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-3100-2282		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed fluorene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-3552-4991		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed fluorene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-4123-0949		Endpoint: Fluorene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed fluorene					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Fluorene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Fluorene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-5437-0629		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed indeno(1,2,3-cd)pyrene					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.286	0.6075	Non-Significant Effect					
Error	0.112	0.014	8								
Total	0.116		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-7419-7339		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed indeno(1,2,3-cd)pyrene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 16-5762-8097		Endpoint: Indeno(1,2,3-cd)pyrene				CETIS Version: CETISv1.9.3					
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed indeno(1,2,3-cd)pyrene				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-5754-1449		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed indeno(1,2,3-cd)pyrene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-0022-9335		Endpoint: Indeno(1,2,3-cd)pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed indeno(1,2,3-cd)pyrene	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Indeno(1,2,3-cd)pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Indeno(1,2,3-cd)pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-1692-6850		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed naphthalene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 04-2995-2727		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed naphthalene				5.73%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.104		0.013	8							
Total	0.104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-0962-8112		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed naphthalene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-7513-6801		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed naphthalene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.004	0.004	1	0.8	0.3972	Non-Significant Effect					
Error	0.04	0.0050000	8								
Total	0.044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-2247-2850		Endpoint: Naphthalene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed naphthalene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	1.421E-14		1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect				
Error	0.0440001		0.0055000	8							
Total	0.0440001			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Naphthalene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Naphthalene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-3186-5631		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed phenanthrene				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.139	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.286	0.6075	Non-Significant Effect				
Error	0.112		0.014	8							
Total	0.116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.3	2.12	2.48	2.2	2.2	2.5	0.0632	6.15%	1.71%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	2.2	2.5	2.2	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-3981-9690		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed phenanthrene					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.134	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.104	0.013	8								
Total	0.104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	2.34	2.17	2.51	2.4	2.2	2.5	0.06	5.73%	0.00%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		2.2	2.4	2.2	2.5	2.4					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-4179-7054		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed phenanthrene				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.025	0.025	1	4.55	0.0656	Non-Significant Effect					
Error	0.044	0.0055	8								
Total	0.069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	2.24	2.17	2.31	2.2	2.2	2.3	0.0245	2.45%	4.27%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		2.2	2.3	2.2	2.3	2.2					

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Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-2865-5228		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed phenanthrene					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

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Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis										EnviroSystems, Inc.	
Analysis ID: 01-7720-5808		Endpoint: Phenanthrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed phenanthrene			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.421E-14	1.421E-14	1	2.58E-12	1.0000	Non-Significant Effect					
Error	0.0440001	0.0055000	8								
Total	0.0440001		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
Phenanthrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	2.34	2.27	2.41	2.3	2.3	2.4	0.0245	2.34%	0.00%
Phenanthrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		2.4	2.4	2.3	2.3	2.3					

CETIS Analytical Report

Report Date: 07 Feb-19 08:49 (p 76 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-7891-2478		Endpoint:	Pyrene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 8:47		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-101 passed pyrene					44.46%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	25.5	n/a	2	8	Exact	0.3452	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.66	2.29	7.1E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.729	0.729	1	0.932	0.3627	Non-Significant Effect					
Error	6.26	0.7825	8								
Total	6.989		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	195	23.2	1.6E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.692	0.741	7.0E-04	Non-Normal Distribution						
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-101		5	2.88	1.33	4.43	2.4	2.2	5.1	0.558	43.33%	-23.08%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-101		2.2	5.1	2.5	2.2	2.4					

CETIS Analytical Report

Report Date: 07 Feb-19 08:49 (p 77 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-4209-7979		Endpoint:	Pyrene		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 8:47		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result			PMSD				
Untransformed	C < T			31243-102 failed pyrene			88.20%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	2.4	2.13	2.06	4	CDF	0.0373	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.76	2.29	0.5667	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	13.456	13.456	1	5.74	0.0434	Significant Effect					
Error	18.744	2.343	8								
Total	32.2		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			585	23.2	1.7E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.891	0.741	0.1731	Normal Distribution				
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-102		5	4.66	1.97	7.35	5	2.4	7.2	0.967	46.41%	-99.15%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-102		7.2	6.2	5	2.5	2.4					

CETIS Analytical Report

Report Date: 07 Feb-19 08:49 (p 78 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-5318-6439		Endpoint: Pyrene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 failed pyrene	107.11%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.38	2.13	2.51	4	CDF	0.0379	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.62	2.29	0.8579	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	19.6	19.6	1	5.67	0.0444	Significant Effect					
Error	27.644	3.4555	8								
Total	47.244		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	863	23.2	8.0E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.88	0.741	0.1304	Normal Distribution						
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-103		5	5.14	1.88	8.4	6.4	2.3	7.6	1.17	51.12%	-119.66%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-103		6.4	2.3	7.1	2.3	7.6					

CETIS Analytical Report

Report Date: 07 Feb-19 08:49 (p 79 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-1966-4873		Endpoint: Pyrene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed pyrene				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.083	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.004		0.004	1	0.8	0.3972	Non-Significant Effect				
Error	0.04		0.0050000	8							
Total	0.044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-104		5	2.38	2.32	2.44	2.4	2.3	2.4	0.02	1.88%	-1.71%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-104		2.4	2.3	2.4	2.4	2.4					

CETIS Analytical Report

Report Date: 07 Feb-19 08:49 (p 80 of 80)
Test Code: 31250Nv-PAH | 19-4111-8504

Bioaccumulation Evaluation - PAHs - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-4299-4260		Endpoint: Pyrene		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:47		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 failed pyrene				60.77%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105*	8.9	2.13	1.42	4	CDF	4.4E-04	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.73	2.29	0.6235	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	88.209	88.209	1	79.3	2.0E-05	Significant Effect					
Error	8.9	1.1125	8								
Total	97.109		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	277	23.2	7.7E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.92	0.741	0.3574	Normal Distribution						
Pyrene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	2.34	2.23	2.45	2.4	2.2	2.4	0.04	3.82%	0.00%
31243-105		5	8.28	6.43	10.1	7.6	6.6	10	0.666	17.98%	-253.85%
Pyrene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	2.2	2.4	2.4	2.4					
31243-105		7.6	9.7	6.6	10	7.5					

Nereis virens
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
PCB Congeners

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
PCB Congeners (ng/g wet wt.)						
PCB 8	0.24	U	0.24	U	1.7	
PCB 18	0.24	U	0.24	U	5.3	
PCB 28	0.24	U	0.24	U	0.23	U
PCB 44	0.24	U	0.24	U	0.23	U
PCB 52	0.24	U	0.24	U	0.58	J
PCB 66	0.24	U	0.24	U	0.23	U
PCB 101	0.50	J	0.24	U	0.53	J
PCB 105	0.24	U	0.24	U	0.23	U
PCB 118	0.24	U	0.24	U	0.23	U
PCB 128	0.24	U	0.24	U	0.23	U
PCB 138	1.8		2.3		2.8	
PCB 153	2.6		2.6		4.2	
PCB 170	0.88	J	1.0		1.7	
PCB 180	2.5		2.7		3.8	
PCB 187	2.1		1.8		2.9	
PCB 195	0.24	U	0.24	U	0.23	U
PCB 206	0.24	U	0.24	U	0.23	U
PCB 209	0.24	U	0.24	U	0.23	U
Total PCBs	26		27		51	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 18	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 28	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 44	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 52	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 66	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 101	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 105	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 118	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 128	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 138	1.4		0.9		0.8	J	1.4		0.9	J
PCB 153	2.1		1.4		1.3		2.1		1.6	
PCB 170	0.76	J	0.22	U	0.24	U	0.54	J	0.24	U
PCB 180	2.3		0.82	J	1.2		1.8		1.1	
PCB 187	1.8		0.58	J	0.61	J	1.5		0.66	J
PCB 195	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 206	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
PCB 209	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Total PCBs	23		14		14		21		15	

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 18	0.22	U	1.0		0.25	U	0.22	U	0.24	U
PCB 28	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 44	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 52	0.50	J	0.69	J	0.82	J	0.53	J	0.64	J
PCB 66	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 101	0.22	U	0.51	J	0.25	U	0.22	U	0.60	J
PCB 105	0.22	U	0.48	J	0.25	U	0.22	U	0.24	U
PCB 118	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 128	0.22	U	0.46	J	0.25	U	0.22	U	0.24	U
PCB 138	1.2		3.3		1.4		1.9		1.9	
PCB 153	1.4		5.5		1.8		3.3		3.3	
PCB 170	0.22	U	2.6		0.25	U	0.83	J	1.4	
PCB 180	1.2		5.9		1.6		3.5		3.2	
PCB 187	0.77	J	3.7		0.79	J	2.4		1.7	
PCB 195	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 206	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
PCB 209	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Total PCBs	16		52		19		30		31	

* = Qualifiers

U Analyte not detected; below the Method Detection Limit

J Analyte estimated; detection below Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 18	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 28	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 44	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 52	0.59	J	0.24	U	0.22	U	0.25	U	0.24	U
PCB 66	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 101	0.63	J	0.57	J	0.60	J	0.25	U	0.24	U
PCB 105	0.59	J	0.24	U	0.22	U	0.25	U	0.24	U
PCB 118	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 128	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 138	3.4		1.9		1.1		1.6		1.2	
PCB 153	5.8		3.2		1.7		2.5		1.9	
PCB 170	2.3		1.1		0.22	U	0.86	J	0.24	U
PCB 180	5.6		2.8		1.3		2.6		1.6	
PCB 187	3.8		2.0		0.88		1.9		1.1	
PCB 195	0.69	J	0.24	U	0.22	U	0.25	U	0.24	U
PCB 206	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
PCB 209	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Total PCBs	51		29		17		25		18	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.22	U	0.23	U	1.7		0.23	U	0.22	U
PCB 18	1.7		1.3		2.1		0.23	U	0.22	U
PCB 28	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 44	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 52	0.82	J	1.1		1.1		0.61	J	1.3	
PCB 66	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 101	0.71	J	0.69	J	0.99		0.23	U	1.3	
PCB 105	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 118	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 128	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 138	2.4		2.1		1.9		1.4		5.0	
PCB 153	3.8		2.6		2.4		2.4		7.5	
PCB 170	1.3		0.23	U	0.22	U	0.23	U	3.5	
PCB 180	3.6		2.1		1.6		1.7		7.4	
PCB 187	2.4		1.7		1.6		1.6		4.8	
PCB 195	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 206	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
PCB 209	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
Total PCBs	38		28		31		21		66	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 18	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 28	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 44	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 52	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 66	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 101	0.64	J	0.23	U	0.24	U	0.24	U	0.24	U
PCB 105	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 118	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 128	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 138	2.5		1.5		0.61	J	1.1		1.8	
PCB 153	3.7		2.5		1.1		1.7		3.2	
PCB 170	1.5		0.72	J	0.24	U	0.76	J	1.4	
PCB 180	3.7		2.2		0.98		0.85	J	3.1	
PCB 187	2.4		1.6		0.24	U	0.69	J	2.2	
PCB 195	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 206	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
PCB 209	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Total PCBs	34		23		13		16		29	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
PCB Congeners (ng/g wet wt.)										
PCB 8	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 18	0.24	U	0.24	U	3.5		0.23	U	0.23	U
PCB 28	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 44	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 52	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 66	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 101	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 105	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 118	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 128	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 138	0.69	J	0.86	J	1.3		1.3		1.5	
PCB 153	1.3		1.3		2.0		2.0		2.7	
PCB 170	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 180	0.64	J	0.64	J	1.4		1.6		1.9	
PCB 187	0.24	U	0.56	J	1.3		1.1		1.1	
PCB 195	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 206	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PCB 209	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Total PCBs	12		13		25		18		21	

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:15 (p 1 of 1)

Test Code/ID: 12-5299-7080/31250Nv-PCB

Bioaccumulation Evaluation - PCB Congeners - Nereis EnviroSystems, Inc.

Start Date: 20 Nov-18 12:03 **Species:** Nereis virens **Sample Code:** 31250-000
End Date: 18 Dec-18 12:03 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 20 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Nv)

Sample	Rep	Pos	PCB 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 183	PCB 184	Total PCBs	
31242-008	1	5	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.4	2.1	0.76	2.3	1.8	0.23	0.23	0.23	0.23	0.23	0.63	0.23		
31242-008	2	11	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.92	1.4	0.22	0.82	0.58	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
31242-008	3	17	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.82	1.3	0.24	1.2	0.61	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31242-008	4	19	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.4	2.1	0.54	1.8	1.5	0.24	0.24	0.24	0.24	0.24	0.24	0.52	0.24	
31242-008	5	25	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.87	1.6	0.24	1.1	0.66	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31243-101	1	3	0.22	0.22	0.22	0.22	0.5	0.22	0.22	0.22	0.22	0.22	1.2	1.4	0.22	1.2	0.77	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
31243-101	2	9	0.22	1	0.22	0.22	0.69	0.22	0.51	0.48	0.22	0.46	3.3	5.5	2.6	5.9	3.7	0.22	0.22	0.22	0.22	0.22	0.22	1.4	0.22	
31243-101	3	13	0.25	0.25	0.25	0.25	0.82	0.25	0.25	0.25	0.25	0.25	1.4	1.8	0.25	1.6	0.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
31243-101	4	24	0.22	0.22	0.22	0.22	0.53	0.22	0.22	0.22	0.22	0.22	1.9	3.3	0.83	3.5	2.4	0.22	0.22	0.22	0.22	0.22	1	0.22		
31243-101	5	29	0.24	0.24	0.24	0.24	0.64	0.24	0.6	0.24	0.24	0.24	1.9	3.3	1.4	3.2	1.7	0.24	0.24	0.24	0.24	0.24	0.99	0.24		
31243-102	1	4	0.22	0.22	0.22	0.22	0.59	0.22	0.63	0.59	0.22	0.22	3.4	5.8	2.3	5.6	3.8	0.69	0.22	0.22	0.22	0.22	1.7	0.22		
31243-102	2	10	0.24	0.24	0.24	0.24	0.24	0.24	0.57	0.24	0.24	0.24	1.9	3.2	1.1	2.8	2	0.24	0.24	0.24	0.24	0.24	0.76	0.24		
31243-102	3	15	0.22	0.22	0.22	0.22	0.22	0.22	0.6	0.22	0.22	0.22	1.1	1.7	0.22	1.3	0.88	0.22	0.22	0.22	0.22	0.22	0.44	0.22		
31243-102	4	21	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.6	2.5	0.86	2.6	1.9	0.25	0.25	0.25	0.25	0.25	0.87	0.25		
31243-102	5	30	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.2	1.9	0.24	1.6	1.1	0.24	0.24	0.24	0.24	0.24	0.56	0.24		
31243-103	1	2	0.22	1.7	0.22	0.22	0.82	0.22	0.71	0.22	0.22	0.22	2.4	3.8	1.3	3.6	2.4	0.22	0.22	0.22	0.22	0.22	0.96	0.22		
31243-103	2	8	0.23	1.3	0.23	0.23	1.1	0.23	0.69	0.23	0.23	0.23	2.1	2.6	0.23	2.1	1.7	0.23	0.23	0.23	0.23	0.23	0.76	0.23		
31243-103	3	14	1.7	2.1	0.22	0.22	1.1	0.22	0.99	0.22	0.22	0.22	1.9	2.4	0.22	1.6	1.6	0.22	0.22	0.22	0.22	1.3	0.6	0.22		
31243-103	4	20	0.23	0.23	0.23	0.23	0.61	0.23	0.23	0.23	0.23	0.23	1.4	2.4	0.23	1.7	1.6	0.23	0.23	0.23	0.23	0.23	0.58	0.23		
31243-103	5	27	0.22	0.22	0.22	0.22	1.3	0.22	1.3	0.22	0.22	0.22	5	7.5	3.5	7.4	4.8	0.22	0.22	0.22	0.22	0.22	2.1	0.22		
31243-104	1	1	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.24	0.24	0.24	2.5	3.7	1.5	3.7	2.4	0.24	0.24	0.24	0.24	0.24	1.1	0.24		
31243-104	2	12	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.5	2.5	0.72	2.2	1.6	0.23	0.23	0.23	0.23	0.23	0.67	0.23		
31243-104	3	18	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.61	1.1	0.24	0.98	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31243-104	4	23	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.1	1.7	0.76	0.85	0.69	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31243-104	5	26	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.8	3.2	1.4	3.1	2.2	0.24	0.24	0.24	0.24	0.24	0.86	0.24		
31243-105	1	6	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.69	1.3	0.24	0.64	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31243-105	2	7	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.86	1.3	0.24	0.64	0.56	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
31243-105	3	16	0.23	3.5	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.3	2	0.23	1.4	1.3	0.23	0.23	0.23	0.23	0.23	0.55	0.23		
31243-105	4	22	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.3	2	0.23	1.6	1.1	0.23	0.23	0.23	0.23	0.23	0.51	0.23		
31243-105	5	28	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.5	2.7	0.23	1.9	1.1	0.23	0.23	0.23	0.23	0.23	0.53	0.23		

CETIS Summary Report

Report Date: 07 Feb-19 08:59 (p 1 of 9)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis **EnviroSystems, Inc.**

Batch ID: 14-8521-9393	Test Type: Bioaccumulation - PCBs - Nv	Analyst: Nancy Roka
Start Date: 20 Nov-18 12:03	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 18 Dec-18 12:03	Species: Nereis virens	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
11-6293-6609	PCB 008	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 008
12-5370-7000	PCB 008	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 008
10-0958-2585	PCB 008	Equal Variance t Two-Sample Test	0.9366	31243-103 passed pcb 008
05-6882-3060	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.8095	31243-103 passed pcb 008
02-8737-0229	PCB 008	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 008
08-4865-7985	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 008
13-4097-2498	PCB 018	Equal Variance t Two-Sample Test	0.5717	31243-101 passed pcb 018
17-9884-6839	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-101 passed pcb 018
05-1476-9782	PCB 018	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 018
07-6364-2943	PCB 018	Unequal Variance t Two-Sample Test	0.0420	31243-103 failed pcb 018
08-7948-8948	PCB 018	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 018
02-5681-1115	PCB 018	Equal Variance t Two-Sample Test	0.4264	31243-105 passed pcb 018
12-7235-1533	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.3611	31243-105 passed pcb 018
18-2811-4275	PCB 028	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 028
18-0214-6474	PCB 028	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 028
10-9104-5152	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 028
14-4675-9807	PCB 028	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 028
04-0286-9394	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 028
00-8780-5410	PCB 044	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 044
21-3624-3681	PCB 044	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 044
09-0793-0409	PCB 044	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 044
04-0033-2893	PCB 044	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 044
15-9645-9929	PCB 044	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 044
14-2637-8904	PCB 052	Unequal Variance t Two-Sample Test	0.0011	31243-101 failed pcb 052
04-9017-1224	PCB 052	Equal Variance t Two-Sample Test	0.3197	31243-102 passed pcb 052
20-0746-4815	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.1984	31243-102 passed pcb 052
01-0589-9465	PCB 052	Unequal Variance t Two-Sample Test	0.0017	31243-103 failed pcb 052
01-8133-5322	PCB 052	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 052
10-5911-0054	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 052
18-8030-3763	PCB 066	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 066
15-1029-0270	PCB 066	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 066
10-3592-3211	PCB 066	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 066
00-3896-4606	PCB 066	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 066

CETIS Summary Report

Report Date: 07 Feb-19 08:59 (p 2 of 9)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis **EnviroSystems, Inc.**

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
04-2800-6482	PCB 066	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 066
03-8378-1432	PCB 101	Unequal Variance t Two-Sample Test	0.0977	31243-101 passed pcb 101
00-8072-0948	PCB 101	Unequal Variance t Two-Sample Test	0.0314	31243-102 failed pcb 101
09-4659-8210	PCB 101	Unequal Variance t Two-Sample Test	0.0181	31243-103 failed pcb 101
21-1684-6051	PCB 101	Equal Variance t Two-Sample Test	0.2549	31243-104 passed pcb 101
07-5194-7433	PCB 101	Wilcoxon Rank Sum Two-Sample Test	0.2421	31243-104 passed pcb 101
20-6924-6284	PCB 101	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 101
16-8554-5999	PCB 105	Equal Variance t Two-Sample Test	0.5717	31243-101 passed pcb 105
18-0181-7950	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-101 passed pcb 105
07-8785-0667	PCB 105	Equal Variance t Two-Sample Test	0.3197	31243-102 passed pcb 105
09-9401-1134	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.1984	31243-102 passed pcb 105
16-7369-1441	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 105
20-3929-1236	PCB 105	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 105
08-6494-7432	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 105
11-8392-1723	PCB 118	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 118
15-4876-6864	PCB 118	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 118
09-0700-1259	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 118
01-9603-4432	PCB 118	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 118
04-8519-2812	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 118
04-4961-7501	PCB 128	Equal Variance t Two-Sample Test	0.5717	31243-101 passed pcb 128
08-0160-3503	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-101 passed pcb 128
14-5158-7822	PCB 128	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 128
13-1775-8631	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 128
20-2981-3996	PCB 128	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 128
05-4360-1100	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 128
07-3923-4895	PCB 138	Equal Variance t Two-Sample Test	0.0294	31243-101 failed pcb 138
10-1604-8179	PCB 138	Equal Variance t Two-Sample Test	0.0236	31243-101 failed pcb 138
02-3288-6218	PCB 138	Equal Variance t Two-Sample Test	0.0600	31243-102 passed pcb 138
09-1276-9526	PCB 138	Equal Variance t Two-Sample Test	0.0691	31243-102 passed pcb 138
18-3519-7354	PCB 138	Equal Variance t Two-Sample Test	0.0040	31243-103 failed pcb 138
06-6096-8619	PCB 138	Unequal Variance t Two-Sample Test	0.0418	31243-103 failed pcb 138
20-7568-6026	PCB 138	Equal Variance t Two-Sample Test	0.1292	31243-104 passed pcb 138
21-4637-3684	PCB 138	Equal Variance t Two-Sample Test	0.4084	31243-105 passed pcb 138
17-7555-1871	PCB 153	Equal Variance t Two-Sample Test	0.0520	31243-101 passed pcb 153
01-2130-8938	PCB 153	Equal Variance t Two-Sample Test	0.0603	31243-102 passed pcb 153
19-3243-2511	PCB 153	Equal Variance t Two-Sample Test	0.0607	31243-102 passed pcb 153
01-9546-8026	PCB 153	Equal Variance t Two-Sample Test	0.0085	31243-103 failed pcb 153
06-2136-4120	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.0040	31243-103 failed pcb 153
02-4585-5256	PCB 153	Equal Variance t Two-Sample Test	0.0903	31243-104 passed pcb 153
12-4375-4832	PCB 153	Equal Variance t Two-Sample Test	0.3112	31243-105 passed pcb 153
16-6184-0001	PCB 170	Equal Variance t Two-Sample Test	0.0923	31243-101 passed pcb 170
01-2200-8170	PCB 170	Equal Variance t Two-Sample Test	0.2014	31243-102 passed pcb 170
05-3176-7922	PCB 170	Equal Variance t Two-Sample Test	0.1029	31243-102 passed pcb 170
08-1611-4290	PCB 170	Wilcoxon Rank Sum Two-Sample Test	0.5476	31243-103 passed pcb 170
21-4204-6097	PCB 170	Wilcoxon Rank Sum Two-Sample Test	0.7778	31243-103 passed pcb 170
19-8791-1887	PCB 170	Equal Variance t Two-Sample Test	0.0382	31243-104 failed pcb 170
17-4336-0101	PCB 170	Unequal Variance t Two-Sample Test	0.9006	31243-105 passed pcb 170
03-8751-1837	PCB 180	Equal Variance t Two-Sample Test	0.0491	31243-101 failed pcb 180
07-8247-7583	PCB 180	Equal Variance t Two-Sample Test	0.0680	31243-102 passed pcb 180
12-9222-0795	PCB 180	Equal Variance t Two-Sample Test	0.0987	31243-102 passed pcb 180
03-2279-5629	PCB 180	Equal Variance t Two-Sample Test	0.0779	31243-103 passed pcb 180
05-4390-3167	PCB 180	Equal Variance t Two-Sample Test	0.0703	31243-103 passed pcb 180
12-8631-2364	PCB 180	Equal Variance t Two-Sample Test	0.1404	31243-104 passed pcb 180

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Bioaccumulation Evaluation - PCB Congeners - Nereis				EnviroSystems, Inc.
Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
06-3650-8296	PCB 180	Equal Variance t Two-Sample Test	0.7053	31243-105 passed pcb 180
06-5261-0709	PCB 187	Equal Variance t Two-Sample Test	0.1013	31243-101 passed pcb 187
11-2776-6571	PCB 187	Equal Variance t Two-Sample Test	0.0770	31243-102 passed pcb 187
00-7104-7720	PCB 187	Equal Variance t Two-Sample Test	0.0255	31243-103 failed pcb 187
16-5635-1341	PCB 187	Equal Variance t Two-Sample Test	0.0351	31243-103 failed pcb 187
04-7675-9424	PCB 187	Equal Variance t Two-Sample Test	0.2224	31243-104 passed pcb 187
02-4504-9367	PCB 187	Equal Variance t Two-Sample Test	0.6924	31243-105 passed pcb 187
21-1876-5519	PCB 195	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 195
20-5792-3653	PCB 195	Equal Variance t Two-Sample Test	0.3197	31243-102 passed pcb 195
20-3233-0170	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.1984	31243-102 passed pcb 195
03-8811-2549	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 195
08-5378-2959	PCB 195	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 195
06-5933-6910	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 195
08-9335-9036	PCB 206	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 206
12-1341-6090	PCB 206	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 206
17-6517-0670	PCB 206	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 206
00-3419-5473	PCB 206	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 206
16-9254-8177	PCB 206	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 206
16-7537-8356	PCB 209	Equal Variance t Two-Sample Test	0.6962	31243-101 passed pcb 209
03-4203-2272	PCB 209	Equal Variance t Two-Sample Test	0.5000	31243-102 passed pcb 209
03-1203-7495	PCB 209	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed pcb 209
09-5588-2269	PCB 209	Equal Variance t Two-Sample Test	0.1986	31243-104 passed pcb 209
06-6086-0310	PCB 209	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed pcb 209

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.52	-0.299	1.34	0.22	1.7	0.295	0.66	126.86%	-122.22%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.386	-0.0405	0.812	0.22	1	0.154	0.343	88.99%	-64.96%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	1.11	0.0472	2.17	0.22	2.1	0.383	0.856	77.12%	-374.36%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.888	-0.925	2.7	0.23	3.5	0.653	1.46	164.43%	-279.49%
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.636	0.476	0.796	0.5	0.82	0.0577	0.129	20.28%	-171.79%
31243-102		5	0.308	0.112	0.504	0.22	0.59	0.0707	0.158	51.30%	-31.62%
31243-103		5	0.986	0.65	1.32	0.61	1.3	0.121	0.271	27.47%	-321.37%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%

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Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.36	0.135	0.585	0.22	0.6	0.0811	0.181	50.35%	-53.85%
31243-102		5	0.458	0.215	0.701	0.24	0.63	0.0875	0.196	42.71%	-95.73%
31243-103		5	0.784	0.291	1.28	0.23	1.3	0.177	0.397	50.62%	-235.04%
31243-104		5	0.318	0.0944	0.542	0.23	0.64	0.0805	0.18	56.62%	-35.90%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.282	0.144	0.42	0.22	0.48	0.0498	0.111	39.52%	-20.51%
31243-102		5	0.308	0.112	0.504	0.22	0.59	0.0707	0.158	51.30%	-31.62%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.278	0.151	0.405	0.22	0.46	0.0459	0.103	36.89%	-18.80%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.82	1.4	0.131	0.292	27.03%	0.00%
31243-101		5	1.94	0.921	2.96	1.2	3.3	0.367	0.82	42.29%	-79.30%
31243-102		5	1.84	0.687	2.99	1.1	3.4	0.415	0.929	50.49%	-70.06%
31243-103		5	2.56	0.807	4.31	1.4	5	0.631	1.41	55.15%	-136.60%
31243-104		5	1.5	0.615	2.39	0.61	2.5	0.32	0.715	47.57%	-38.82%
31243-105		5	1.13	0.708	1.55	0.69	1.5	0.152	0.34	30.05%	-4.44%
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.3	2.1	0.17	0.381	22.40%	0.00%
31243-101		5	3.06	1.06	5.06	1.4	5.5	0.722	1.61	52.72%	-80.00%
31243-102		5	3.02	0.958	5.08	1.7	5.8	0.743	1.66	54.98%	-77.65%
31243-103		5	3.74	1.03	6.45	2.4	7.5	0.975	2.18	58.32%	-120.00%
31243-104		5	2.44	1.12	3.76	1.1	3.7	0.475	1.06	43.53%	-43.53%
31243-105		5	1.86	1.13	2.59	1.3	2.7	0.262	0.586	31.49%	-9.41%

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Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.22	0.76	0.108	0.241	60.31%	0.00%
31243-101		5	1.06	-0.166	2.29	0.22	2.6	0.442	0.988	93.17%	-165.00%
31243-102		5	0.944	-0.111	2	0.22	2.3	0.38	0.85	90.04%	-136.00%
31243-103		5	1.1	-0.67	2.86	0.22	3.5	0.636	1.42	129.74%	-174.00%
31243-104		5	0.924	0.274	1.57	0.24	1.5	0.234	0.523	56.62%	-131.00%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	41.50%
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	0.82	2.3	0.267	0.597	41.36%	0.00%
31243-101		5	3.08	0.768	5.39	1.2	5.9	0.833	1.86	60.45%	-113.30%
31243-102		5	2.78	0.668	4.89	1.3	5.6	0.761	1.7	61.17%	-92.52%
31243-103		5	3.28	0.252	6.31	1.6	7.4	1.09	2.44	74.35%	-127.15%
31243-104		5	2.17	0.6	3.73	0.85	3.7	0.564	1.26	58.24%	-50.00%
31243-105		5	1.24	0.525	1.95	0.64	1.9	0.256	0.572	46.31%	14.40%
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.58	1.8	0.258	0.577	55.97%	0.00%
31243-101		5	1.87	0.347	3.4	0.77	3.7	0.549	1.23	65.62%	-81.75%
31243-102		5	1.94	0.508	3.36	0.88	3.8	0.514	1.15	59.42%	-87.96%
31243-103		5	2.42	0.717	4.12	1.6	4.8	0.614	1.37	56.69%	-134.95%
31243-104		5	1.43	0.26	2.59	0.24	2.4	0.42	0.939	65.84%	-38.45%
31243-105		5	0.86	0.311	1.41	0.24	1.3	0.198	0.442	51.45%	16.50%
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.328	0.0764	0.58	0.22	0.69	0.0906	0.203	61.79%	-40.17%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 008 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	1.7	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 018 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	1	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		1.7	1.3	2.1	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	3.5	0.23	0.23	
PCB 028 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 044 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 052 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.5	0.69	0.82	0.53	0.64	
31243-102		0.59	0.24	0.22	0.25	0.24	
31243-103		0.82	1.1	1.1	0.61	1.3	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 066 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 101 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.51	0.25	0.22	0.6	
31243-102		0.63	0.57	0.6	0.25	0.24	
31243-103		0.71	0.69	0.99	0.23	1.3	
31243-104		0.64	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 105 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.48	0.25	0.22	0.24	
31243-102		0.59	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 118 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 128 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.46	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 138 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	1.4	0.92	0.82	1.4	0.87	
31243-101		1.2	3.3	1.4	1.9	1.9	
31243-102		3.4	1.9	1.1	1.6	1.2	
31243-103		2.4	2.1	1.9	1.4	5	
31243-104		2.5	1.5	0.61	1.1	1.8	
31243-105		0.69	0.86	1.3	1.3	1.5	
PCB 153 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.1	1.4	1.3	2.1	1.6	
31243-101		1.4	5.5	1.8	3.3	3.3	
31243-102		5.8	3.2	1.7	2.5	1.9	
31243-103		3.8	2.6	2.4	2.4	7.5	
31243-104		3.7	2.5	1.1	1.7	3.2	
31243-105		1.3	1.3	2	2	2.7	

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 170 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.76	0.22	0.24	0.54	0.24	
31243-101		0.22	2.6	0.25	0.83	1.4	
31243-102		2.3	1.1	0.22	0.86	0.24	
31243-103		1.3	0.23	0.22	0.23	3.5	
31243-104		1.5	0.72	0.24	0.76	1.4	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 180 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	2.3	0.82	1.2	1.8	1.1	
31243-101		1.2	5.9	1.6	3.5	3.2	
31243-102		5.6	2.8	1.3	2.6	1.6	
31243-103		3.6	2.1	1.6	1.7	7.4	
31243-104		3.7	2.2	0.98	0.85	3.1	
31243-105		0.64	0.64	1.4	1.6	1.9	
PCB 187 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	1.8	0.58	0.61	1.5	0.66	
31243-101		0.77	3.7	0.79	2.4	1.7	
31243-102		3.8	2	0.88	1.9	1.1	
31243-103		2.4	1.7	1.6	1.6	4.8	
31243-104		2.4	1.6	0.24	0.69	2.2	
31243-105		0.24	0.56	1.3	1.1	1.1	
PCB 195 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.69	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 206 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 209 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	25.5		0.3452381	0.05	FALSE		8	2	E
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1875523	1.89458	0.5717258	0.05	FALSE	0.0151524	7		C
PCB 028	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 044	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 052	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	6.95381	2.13185	0.0011236	0.05	TRUE	0.1232421	4		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 2	1.5526	2.13185	0.0977369	0.05	FALSE	0.1730083	4		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	25.5		0.3452381	0.05	FALSE		8	2	E
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1875523	1.89458	0.5717258	0.05	FALSE	0.0151524	7		C
PCB 118	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 128	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 2	25.5		0.3452381	0.05	FALSE		8	2	E
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.1875523	1.89458	0.5717258	0.05	FALSE	0.0151524	7		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	2.20287	1.85955	0.0293653	0.05	TRUE	0.724279	8		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	2.404252	1.89458	0.0235853	0.05	TRUE	0.4081901	7		C
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	1.834491	1.85955	0.0519597	0.05	FALSE	1.378576	8		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	1.451584	1.85955	0.0923381	0.05	FALSE	0.8454913	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	1.870801	1.85955	0.049143	0.05	TRUE	1.62616	8		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	1.387555	1.85955	0.1013491	0.05	FALSE	1.128416	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 2	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 028	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 044	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	22.5		0.1984127	0.05	FALSE		8	2	E
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.489584	1.89458	0.3196984	0.05	FALSE	0.0135442	7		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 3	2.557704	2.13185	0.0313953	0.05	TRUE	0.186704	4		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	22.5		0.1984127	0.05	FALSE		8	2	E
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.489584	1.89458	0.3196984	0.05	FALSE	0.0135442	7		C
PCB 118	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.740327	1.85955	0.0599923	0.05	FALSE	0.8099266	8		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.673627	1.89458	0.0690593	0.05	FALSE	0.4165833	7		C
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.732648	1.85955	0.0606964	0.05	FALSE	1.416678	8		C

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Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.76638	1.89458	0.0603364	0.05	FALSE	0.6703608	7		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.376726	1.85955	0.1029467	0.05	FALSE	0.7347827	8		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.8905411	1.89458	0.2013721	0.05	FALSE	0.4361266	7		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.657441	1.85955	0.0680094	0.05	FALSE	1.498911	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.424039	1.89458	0.0987243	0.05	FALSE	0.8394986	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	1.574341	1.85955	0.0770279	0.05	FALSE	1.070131	8		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 3	22.5		0.1984127	0.05	FALSE		8	2	E
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0.489584	1.89458	0.3196984	0.05	FALSE	0.0135442	7		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 3	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	31		0.8095238	0.05	FALSE		8	2	E
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	-1.73205	1.89458	0.9365647	0.05	FALSE	0.00984452	7		C
PCB 018	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	2.288244	2.13185	0.0420097	0.05	TRUE	0.8161271	4		C
PCB 028	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 044	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 052	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	6.20408	2.13185	0.0017167	0.05	TRUE	0.2584023	4		C
PCB 066	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 101	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	3.098309	2.13185	0.0181403	0.05	TRUE	0.3784373	4		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 118	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 128	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 138	Unequal Variance t Two-Sample Test	CLDS	vs Comp 4	2.292357	2.13185	0.0418198	0.05	TRUE	1.374511	4		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	3.665931	1.89458	0.0040036	0.05	TRUE	0.4485884	7		C
PCB 153	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	15		0.0039683	0.05	TRUE		8	0	E
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	3.114832	1.89458	0.008483	0.05	TRUE	0.6690687	7		C
PCB 170	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	27.5		0.547619	0.05	FALSE		8	1	E
PCB 170	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	22.5		0.7777778	0.05	FALSE		7	1	E
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	1.635161	1.85955	0.0703272	0.05	FALSE	2.087947	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	1.590106	1.89458	0.0779181	0.05	FALSE	0.9603327	7		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	2.088679	1.85955	0.035081	0.05	TRUE	1.237515	8		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 4	2.35209	1.89458	0.0254653	0.05	TRUE	0.6403624	7		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 206	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 209	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 4	35.5		0.9761904	0.05	FALSE		8	2	E
PCB 008	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 028	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C

STUDY: 31250
CLIENT: AECOM
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ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 044	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 052	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 066	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 101	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 5	23		0.2420635	0.05	FALSE		8	2	E
PCB 101	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.6945642	1.89458	0.2548586	0.05	FALSE	0.00954703	7		C
PCB 105	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 118	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 128	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	1.216457	1.85955	0.1292403	0.05	FALSE	0.642037	8		C
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	1.466569	1.85955	0.090334	0.05	FALSE	0.9382889	8		C
PCB 170	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	2.033882	1.85955	0.0381979	0.05	TRUE	0.4790854	8		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	1.156731	1.85955	0.1403766	0.05	FALSE	1.16068	8		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8036639	1.85955	0.2224061	0.05	FALSE	0.9162799	8		C
PCB 195	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 206	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 209	Equal Variance t Two-Sample Test	CLDS	vs Comp 5	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 018	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	25		0.3611111	0.05	FALSE		8	2	E
PCB 018	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.1924506	1.89458	0.4264268	0.05	FALSE	0.00984452	7		C
PCB 028	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 044	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 052	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 066	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 101	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 105	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 118	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 128	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 138	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.2395095	1.85955	0.4083664	0.05	FALSE	0.3726712	8		C
PCB 153	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	0.5121476	1.85955	0.3111916	0.05	FALSE	0.5809414	8		C
PCB 170	Unequal Variance t Two-Sample Test	CLDS	vs Comp 6	-1.538224	2.13185	0.9005907	0.05	FALSE	0.2300617	4		C
PCB 180	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-0.5622197	1.85955	0.7053161	0.05	FALSE	0.6879624	8		C
PCB 187	Equal Variance t Two-Sample Test	CLDS	vs Comp 6	-0.5230398	1.85955	0.6924401	0.05	FALSE	0.604396	8		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 206	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E
PCB 209	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs Comp 6	28.5		0.6587301	0.05	FALSE		8	2	E

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	11-6293-6609		Endpoint:	PCB 008		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 8:52		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed pcb 008			5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.5	23.2	0.3965	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.907	0.741	0.2642	Normal Distribution					
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-5370-7000		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 008			5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 05-6882-3060		Endpoint: PCB 008			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed pcb 008					234.46%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	31	n/a	2	8	Exact	0.8095	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.68	2.29	4.4E-04	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.20449	0.20449	1	0.94	0.3607	Non-Significant Effect					
Error	1.74092	0.217615	8								
Total	1.94541		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5440	23.2	<1.0E-37	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.633	0.741	1.4E-04	Non-Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.52	-0.299	1.34	0.23	0.22	1.7	0.295	126.86%	-122.22%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	1.7	0.23	0.22					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-0958-2585	Endpoint:	PCB 008	CETIS Version:	CETISv1.9.3						
Analyzed:	07 Feb-19 8:53	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed pcb 008				4.21%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-1.73	1.89	0.01	7	CDF	0.9366	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.00018		0.00018		1	3	0.1269	Non-Significant Effect			
Error	0.00042		0.00006		7						
Total	0.0006				8						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.4	46.2	0.4979	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.804	0.701	0.0227	Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		4	0.225	0.216	0.234	0.225	0.22	0.23	0.00289	2.57%	3.85%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	Outlier	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-8737-0229		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 008			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-4865-7985		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 008	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 17-9884-6839		Endpoint: PCB 018			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:52		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-101 passed pcb 018				122.11%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	25.5	n/a	2	8	Exact	0.3452	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.7E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.05776	0.05776	1	0.978	0.3515	Non-Significant Effect					
Error	0.47224	0.05903	8								
Total	0.53		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1470	23.2	2.8E-06	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.651	0.741	2.3E-04	Non-Normal Distribution					
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.386	-0.0405	0.812	0.24	0.22	1	0.154	88.99%	-64.96%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	1	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-1476-9782		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 018			5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Report Date: 07 Feb-19 08:57 (p 9 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6364-2943		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 018			348.77%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.29	2.13	0.816	4	CDF	0.0420	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.73	2.29	0.6137	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.91844	1.91844	1	5.24	0.0514	Non-Significant Effect					
Error	2.93112	0.36639	8								
Total	4.84956		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			9160	23.2	<1.0E-37	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.881	0.741	0.1346	Normal Distribution				
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	1.11	0.0472	2.17	1.3	0.22	2.1	0.383	77.12%	-374.36%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		1.7	1.3	2.1	0.23	0.22					

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Report Date: 07 Feb-19 08:57 (p 10 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-7948-8948		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 018			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Report Date: 07 Feb-19 08:57 (p 11 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7235-1533		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 018				518.94%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	25	n/a	2	8	Exact	0.3611	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.68	2.29	4.4E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.06929	1.06929	1	1	0.3459	Non-Significant Effect					
Error	8.5286	1.06607	8								
Total	9.59789		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	26700	23.2	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.629	0.741	1.2E-04	Non-Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.888	-0.925	2.7	0.24	0.23	3.5	0.653	164.43%	-279.49%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	3.5	0.23	0.23					

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Report Date: 07 Feb-19 08:57 (p 12 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-2811-4275		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 028				5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-0214-6474		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 028				5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.25	23.2	0.4515	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0298	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 10-9104-5152		Endpoint: PCB 028			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed pcb 028			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 15 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-4675-9807		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 028			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 16 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-0286-9394		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 028	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

CETIS Analytical Report

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-8780-5410		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed pcb 044			5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.907	0.741	0.2642		Normal Distribution				
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 18 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-3624-3681		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 044				5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.25	23.2	0.4515	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0298	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 19 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-0793-0409		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 044	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 20 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-0033-2893		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 044				3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1484	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.8	0.3972	Non-Significant Effect					
Error	0.0004	0.00005	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	23.2	0.2080	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.741	0.0337	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Report Date: 07 Feb-19 08:58 (p 21 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-9645-9929		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 044			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 22 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-2637-8904		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 failed pcb 052				52.67%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	6.95	2.13	0.123	4	CDF	0.0011	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.14	2.29	0.1244	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.40401	0.40401	1	48.4	1.2E-04	Significant Effect					
Error	0.06684	0.008355	8								
Total	0.47085		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	208	23.2	1.4E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.875	0.741	0.1139	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.636	0.476	0.796	0.64	0.5	0.82	0.0577	20.28%	-171.79%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.5	0.69	0.82	0.53	0.64					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 23 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-0746-4815		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 052	56.25%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	22.5	n/a	2	8	Exact	0.1984	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.67	2.29	5.6E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01369	0.01369	1	1.09	0.3264	Non-Significant Effect					
Error	0.1002	0.012525	8								
Total	0.11389		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	312	23.2	6.1E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.678	0.741	4.8E-04	Non-Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	-31.62%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.59	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 24 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-0589-9465		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 052			110.43%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	6.2	2.13	0.258	4	CDF	0.0017	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.08	2.29	0.1628	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.41376	1.41376	1	38.5	2.6E-04	Significant Effect					
Error	0.29384	0.03673	8								
Total	1.7076		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			917	23.2	7.1E-06	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.908	0.741	0.2700	Normal Distribution				
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.986	0.65	1.32	1.1	0.61	1.3	0.121	27.47%	-321.37%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.82	1.1	1.1	0.61	1.3					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 25 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-8133-5322		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 052			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-5911-0054		Endpoint:	PCB 052		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 8:53		Analysis:	Nonparametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed pcb 052				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Report Date: 07 Feb-19 08:58 (p 27 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-8030-3763		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 066	5.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Report Date: 07 Feb-19 08:58 (p 28 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-1029-0270		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result			PMSD				
Untransformed	C < T			31243-102 passed pcb 066			5.73%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 10-3592-3211		Endpoint: PCB 066			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed pcb 066					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-3896-4606		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 066			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 04-2800-6482		Endpoint: PCB 066			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 066				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Report Date: 07 Feb-19 08:58 (p 32 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-8378-1432		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 101			73.94%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	1.55	2.13	0.173	4	CDF	0.0977	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.98	2.29	0.2507	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.03969	0.03969	1	2.41	0.1591	Non-Significant Effect					
Error	0.13172	0.016465	8								
Total	0.17141		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	411	23.2	3.5E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.883	0.741	0.1430	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.36	0.135	0.585	0.25	0.22	0.6	0.0811	50.35%	-53.85%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.51	0.25	0.22	0.6					

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Report Date: 07 Feb-19 08:58 (p 33 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-8072-0948		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 failed pcb 101			79.79%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102*	2.56	2.13	0.187	4	CDF	0.0314	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.67	2.29	0.7460	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.12544	0.12544	1	6.54	0.0338	Significant Effect					
Error	0.1534	0.019175	8								
Total	0.27884		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			478	23.2	2.6E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1258	Normal Distribution				
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.458	0.215	0.701	0.57	0.24	0.63	0.0875	42.71%	-95.73%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.63	0.57	0.6	0.25	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 34 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-4659-8210		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 101			161.73%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	3.1	2.13	0.378	4	CDF	0.0181	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.09	2.29	0.1532	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.75625		0.75625	1	9.6	0.0147	Significant Effect				
Error	0.63024		0.07878	8							
Total	1.38649			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1970	23.2	1.5E-06	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.852	0.741	0.0606	Normal Distribution				
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.784	0.291	1.28	0.71	0.23	1.3	0.177	50.62%	-235.04%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.71	0.69	0.99	0.23	1.3					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-1684-6051		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed pcb 101			4.08%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.695	1.89	0.01	7	CDF	0.2549	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.722E-05	2.722E-05	1	0.482	0.5097	Non-Significant Effect					
Error	0.000395	5.643E-05	7								
Total	0.0004222		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.2	46.2	0.3666	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.832	0.701	0.0475	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		4	0.237	0.23	0.245	0.24	0.23	0.24	0.0025	2.11%	-1.50%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		Outlier	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-6924-6284		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 101	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 18-0181-7950		Endpoint: PCB 105			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:52		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed pcb 105					39.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	25.5	n/a	2	8	Exact	0.3452	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.66	2.29	7.9E-04	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00576	0.00576	1	0.922	0.3652	Non-Significant Effect					
Error	0.05	0.00625	8								
Total	0.05576		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			155	23.2	2.4E-04	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.699	0.741	8.5E-04	Non-Normal Distribution				
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.282	0.144	0.42	0.24	0.22	0.48	0.0498	39.52%	-20.51%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.48	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-8554-5999		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 105				6.48%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.188	1.89	0.015	7	CDF	0.5717	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.000005	0.000005	1	0.0352	0.8565	Non-Significant Effect					
Error	0.000995	0.0001421	7								
Total	0.001		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.81	24.3	0.3434	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.883	0.701	0.1700	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	0.64%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	Outlier	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-9401-1134		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 105	56.25%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	22.5	n/a	2	8	Exact	0.1984	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.67	2.29	5.6E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01369	0.01369	1	1.09	0.3264	Non-Significant Effect					
Error	0.1002	0.012525	8								
Total	0.11389		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	312	23.2	6.1E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.678	0.741	4.8E-04	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	-31.62%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.59	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 16-7369-1441		Endpoint: PCB 105			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 105				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-3929-1236		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 105	3.55%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1484	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.8	0.3972	Non-Significant Effect					
Error	0.0004	0.00005	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	23.2	0.2080	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.741	0.0337	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-6494-7432		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 105				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-8392-1723		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 118				5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-4876-6864		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 118			5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.49	2.29	1.0000		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0		0	1	0	1.0000		Non-Significant Effect			
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.25	23.2	0.4515		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.826	0.741	0.0298		Normal Distribution				
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 09-0700-1259		Endpoint: PCB 118			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 118				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-9603-4432		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 118			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 04-8519-2812		Endpoint: PCB 118			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 118				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 08-0160-3503		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-101 passed pcb 128				36.59%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	25.5	n/a	2	8	Exact	0.3452	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.65	2.29	8.8E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00484	0.00484	1	0.913	0.3672	Non-Significant Effect					
Error	0.0424	0.0053	8								
Total	0.04724		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		132	23.2	3.4E-04	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.704	0.741	9.8E-04	Non-Normal Distribution					
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.278	0.151	0.405	0.24	0.22	0.46	0.0459	36.89%	-18.80%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.46	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-5158-7822		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 128	5.73%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.25	23.2	0.4515	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0298	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 13-1775-8631		Endpoint: PCB 128			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 128				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Report Date: 07 Feb-19 08:58 (p 51 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-2981-3996		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 128			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-4360-1100		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 128	3.73%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-3923-4895		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 failed pcb 138	66.94%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.2	1.86	0.724	8	CDF	0.0294	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.34	2.29	0.0345	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.84041	1.84041	1	4.85	0.0587	Non-Significant Effect					
Error	3.03408	0.37926	8								
Total	4.87449		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	7.87	23.2	0.0705	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.884	0.741	0.1436	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-101		5	1.94	0.921	2.96	1.9	1.2	3.3	0.367	42.29%	-79.30%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-101		1.2	3.3	1.4	1.9	1.9					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-1604-8179		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 failed pcb 138				37.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	2.4	1.89	0.408	7	CDF	0.0236	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.596276	0.596276	1	5.78	0.0472	Significant Effect					
Error	0.72208	0.103154	7								
Total	1.31836		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.48	24.3	0.6939	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.799	0.701	0.0201	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-101		4	1.6	1.03	2.17	1.65	1.2	1.9	0.178	22.24%	-47.87%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-101		1.2	Outlier	1.4	1.9	1.9					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-1276-9526		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 138				38.50%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.67	1.89	0.417	7	CDF	0.0691	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.300942	0.300942	1	2.8	0.1381	Non-Significant Effect					
Error	0.75208	0.10744	7								
Total	1.05302		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.6	24.3	0.6457	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.864	0.701	0.1054	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-102		4	1.45	0.862	2.04	1.4	1.1	1.9	0.185	25.50%	-34.01%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-102		Outlier	1.9	1.1	1.6	1.2					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-6096-8619		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 failed pcb 138	127.03%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.29	2.13	1.37	4	CDF	0.0418	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.54	2.29	0.0052	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.46121	5.46121	1	5.25	0.0511	Non-Significant Effect					
Error	8.31408	1.03926	8								
Total	13.7753		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	23.3	23.2	0.0099	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.793	0.741	0.0121	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-103		5	2.56	0.807	4.31	2.1	1.4	5	0.631	55.15%	-136.60%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-103		2.4	2.1	1.9	1.4	5					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-3519-7354		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 failed pcb 138			41.46%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	3.67	1.89	0.449	7	CDF	0.0040	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.67428	1.67428	1	13.4	0.0080	Significant Effect					
Error	0.87208	0.124583	7								
Total	2.54636		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.07	24.3	0.4949	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.953	0.701	0.7185	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-103		4	1.95	1.28	2.62	2	1.4	2.4	0.21	21.55%	-80.22%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-103		2.4	2.1	1.9	1.4	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-7568-6026		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 138				59.34%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.22	1.86	0.642	8	CDF	0.1292	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.94	2.29	0.3006	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.441	0.441	1	1.48	0.2585	Non-Significant Effect					
Error	2.38416	0.29802	8								
Total	2.82516		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.97	23.2	0.1117	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.962	0.741	0.8097	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-104		5	1.5	0.615	2.39	1.5	0.61	2.5	0.32	47.57%	-38.82%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-104		2.5	1.5	0.61	1.1	1.8					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-4637-3684		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 138			34.44%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.24	1.86	0.373	8	CDF	0.4084	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.47	2.29	1.0000	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00576	0.00576	1	0.0574	0.8167	Non-Significant Effect					
Error	0.80328	0.10041	8								
Total	0.80904		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.35	23.2	0.7792	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.884	0.741	0.1451	Normal Distribution					
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	0.00%
31243-105		5	1.13	0.708	1.55	1.3	0.69	1.5	0.152	30.05%	-4.44%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.4	0.92	0.82	1.4	0.87					
31243-105		0.69	0.86	1.3	1.3	1.5					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-7555-1871		Endpoint: PCB 153		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 153	81.09%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	1.83	1.86	1.38	8	CDF	0.0520	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.21	2.29	0.0835	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.624	4.624	1	3.37	0.1039	Non-Significant Effect					
Error	10.992	1.374	8								
Total	15.616		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	18	23.2	0.0161	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.903	0.741	0.2336	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	0.00%
31243-101		5	3.06	1.06	5.06	3.3	1.4	5.5	0.722	52.72%	-80.00%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.1	1.4	1.3	2.1	1.6					
31243-101		1.4	5.5	1.8	3.3	3.3					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-3243-2511		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 153			83.33%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.73	1.86	1.42	8	CDF	0.0607	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.45	2.29	0.0141		Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	4.356		4.356	1	3	0.1214		Non-Significant Effect			
Error	11.608		1.451	8							
Total	15.964		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		19	23.2	0.0145		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.843	0.741	0.0483		Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	0.00%
31243-102		5	3.02	0.958	5.08	2.5	1.7	5.8	0.743	54.98%	-77.65%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.1	1.4	1.3	2.1	1.6					
31243-102		5.8	3.2	1.7	2.5	1.9					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-9546-8026		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 failed pcb 153				39.36%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	3.11	1.89	0.669	7	CDF	0.0085	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.68889	2.68889	1	9.7	0.0170	Significant Effect					
Error	1.94	0.277143	7								
Total	4.62889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.13	24.3	0.2996	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.82	0.701	0.0343	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	0.00%
31243-103		4	2.8	1.73	3.87	2.5	2.4	3.8	0.337	24.05%	-64.71%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.1	1.4	1.3	2.1	1.6					
31243-103		3.8	2.6	2.4	2.4	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-4585-5256		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 153			55.19%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.47	1.86	0.938	8	CDF	0.0903	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.78	2.29	0.5287		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	1.369		1.369	1	2.15	0.1807		Non-Significant Effect			
Error	5.092		0.6365	8							
Total	6.461		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		7.78	23.2	0.0719		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.993	0.741	0.9993		Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	0.00%
31243-104		5	2.44	1.12	3.76	2.5	1.1	3.7	0.475	43.53%	-43.53%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.1	1.4	1.3	2.1	1.6					
31243-104		3.7	2.5	1.1	1.7	3.2					

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Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 12-4375-4832		Endpoint: PCB 153			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 153				34.17%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.512	1.86	0.581	8	CDF	0.3112	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.8	2.29	0.4913	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.064	0.064	1	0.262	0.6224	Non-Significant Effect					
Error	1.952	0.244	8								
Total	2.016		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.37	23.2	0.4248	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.939	0.741	0.5463	Normal Distribution				
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	0.00%
31243-105		5	1.86	1.13	2.59	2	1.3	2.7	0.262	31.49%	-9.41%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.1	1.4	1.3	2.1	1.6					
31243-105		1.3	1.3	2	2	2.7					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-6184-0001		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 170				211.37%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	1.45	1.86	0.845	8	CDF	0.0923	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.27	2.29	0.0563	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.089	1.089	1	2.11	0.1847	Non-Significant Effect					
Error	4.1346	0.516825	8								
Total	5.2236		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	16.8	23.2	0.0183	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.884	0.741	0.1450	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	0.00%
31243-101		5	1.06	-0.166	2.29	0.83	0.22	2.6	0.442	93.17%	-165.00%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.76	0.22	0.24	0.54	0.24					
31243-101		0.22	2.6	0.25	0.83	1.4					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-2200-8170		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 170				109.03%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.891	1.89	0.436	7	CDF	0.2014	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0933889	0.0933889	1	0.793	0.4027	Non-Significant Effect					
Error	0.8243	0.117757	7								
Total	0.917689		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.39	24.3	0.2693	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.914	0.701	0.3429	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	0.00%
31243-102		4	0.605	-0.102	1.31	0.55	0.22	1.1	0.222	73.39%	-51.25%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.76	0.22	0.24	0.54	0.24					
31243-102		Outlier	1.1	0.22	0.86	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-1611-4290		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 170				299.86%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	27.5	n/a	1	8	Exact	0.5476	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.5	2.29	0.0082	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.21104	1.21104	1	1.16	0.3120	Non-Significant Effect					
Error	8.32092	1.04011	8								
Total	9.53196		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	34.7	23.2	0.0046	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.784	0.741	0.0092	Non-Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	0.00%
31243-103		5	1.1	-0.67	2.86	0.23	0.22	3.5	0.636	129.74%	-174.00%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.76	0.22	0.24	0.54	0.24					
31243-103		1.3	0.23	0.22	0.23	3.5					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-8791-1887		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 failed pcb 170			119.77%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	2.03	1.86	0.479	8	CDF	0.0382	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.78	2.29	0.5296	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.68644		0.68644	1	4.14	0.0764	Non-Significant Effect				
Error	1.32752		0.16594	8							
Total	2.01396			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.7	23.2	0.1629	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.911	0.741	0.2873	Normal Distribution				
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	0.00%
31243-104		5	0.924	0.274	1.57	0.76	0.24	1.5	0.234	56.62%	-131.00%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.76	0.22	0.24	0.54	0.24					
31243-104		1.5	0.72	0.24	0.76	1.4					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-4336-0101		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 170				57.52%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-1.54	2.13	0.23	4	CDF	0.9006	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.24	2.29	0.0699	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.06889	0.06889	1	2.37	0.1626	Non-Significant Effect					
Error	0.23292	0.029115	8								
Total	0.30181		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1940	23.2	1.6E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.851	0.741	0.0603	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	41.50%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.76	0.22	0.24	0.54	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-8751-1837		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 failed pcb 180			112.61%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101*	1.87	1.86	1.63	8	CDF	0.0491	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.16	2.29	0.1073	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	6.69124	6.69124	1	3.5	0.0983	Non-Significant Effect					
Error	15.2947	1.91184	8								
Total	21.986		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			9.72	23.2	0.0490	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.939	0.741	0.5396	Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	0.00%
31243-101		5	3.08	0.768	5.39	3.2	1.2	5.9	0.833	60.45%	-113.30%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	0.82	1.2	1.8	1.1					
31243-101		1.2	5.9	1.6	3.5	3.2					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-8247-7583		Endpoint: PCB 180		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 180	103.80%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.66	1.86	1.5	8	CDF	0.0680	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.35	2.29	0.0333	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.46224	4.46224	1	2.75	0.1360	Non-Significant Effect					
Error	12.9947	1.62434	8								
Total	17.457		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	8.11	23.2	0.0670	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.886	0.741	0.1548	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	0.00%
31243-102		5	2.78	0.668	4.89	2.6	1.3	5.6	0.761	61.17%	-92.52%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	0.82	1.2	1.8	1.1					
31243-102		5.6	2.8	1.3	2.6	1.6					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-4390-3167		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed pcb 180			144.59%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	1.64	1.86	2.09	8	CDF	0.0703	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.46	2.29	0.0124	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.42724	8.42724	1	2.67	0.1407	Non-Significant Effect					
Error	25.2147	3.15184	8								
Total	33.642		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		16.7	23.2	0.0185	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.831	0.741	0.0346	Normal Distribution					
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	0.00%
31243-103		5	3.28	0.252	6.31	2.1	1.6	7.4	1.09	74.35%	-127.15%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	0.82	1.2	1.8	1.1					
31243-103		3.6	2.1	1.6	1.7	7.4					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8631-2364		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 180			80.38%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.16	1.86	1.16	8	CDF	0.1404	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.65	2.29	0.7928		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	1.30321		1.30321	1	1.34	0.2808		Non-Significant Effect			
Error	7.79184		0.97398	8							
Total	9.09505			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4.46	23.2	0.1766		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.968	0.741	0.8750		Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	0.00%
31243-104		5	2.17	0.6	3.73	2.2	0.85	3.7	0.564	58.24%	-50.00%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	0.82	1.2	1.8	1.1					
31243-104		3.7	2.2	0.98	0.85	3.1					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-3650-8296		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 180				47.64%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-0.562	1.86	0.688	8	CDF	0.7053	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.55	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.10816	0.10816	1	0.316	0.5894	Non-Significant Effect					
Error	2.73744	0.34218	8								
Total	2.8456		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.09	23.2	0.9365	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.902	0.741	0.2326	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	0.00%
31243-105		5	1.24	0.525	1.95	1.4	0.64	1.9	0.256	46.31%	14.40%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	2.3	0.82	1.2	1.8	1.1					
31243-105		0.64	0.64	1.4	1.6	1.9					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-5261-0709		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 187	109.55%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	1.39	1.86	1.13	8	CDF	0.1013	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.02	2.29	0.2141	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.77241	1.77241	1	1.93	0.2027	Non-Significant Effect					
Error	7.36468	0.920585	8								
Total	9.13709		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.54	23.2	0.1720	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.93	0.741	0.4479	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	0.00%
31243-101		5	1.87	0.347	3.4	1.7	0.77	3.7	0.549	65.62%	-81.75%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.8	0.58	0.61	1.5	0.66					
31243-101		0.77	3.7	0.79	2.4	1.7					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-2776-6571		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 187	103.90%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	1.57	1.86	1.07	8	CDF	0.0770	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.17	2.29	0.1018	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.05209	2.05209	1	2.48	0.1541	Non-Significant Effect					
Error	6.62352	0.82794	8								
Total	8.67561		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.98	23.2	0.2094	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.924	0.741	0.3896	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	0.00%
31243-102		5	1.94	0.508	3.36	1.9	0.88	3.8	0.514	59.42%	-87.96%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.8	0.58	0.61	1.5	0.66					
31243-102		3.8	2	0.88	1.9	1.1					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-5635-1341		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 failed pcb 187			120.15%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.09	1.86	1.24	8	CDF	0.0351	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.4	2.29	0.0219	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.83025	4.83025	1	4.36	0.0702	Non-Significant Effect					
Error	8.8576	1.1072	8								
Total	13.6879		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.66	23.2	0.1217	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.804	0.741	0.0163	Normal Distribution				
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	0.00%
31243-103		5	2.42	0.717	4.12	1.7	1.6	4.8	0.614	56.69%	-134.95%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.8	0.58	0.61	1.5	0.66					
31243-103		2.4	1.7	1.6	1.6	4.8					

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Report Date: 07 Feb-19 08:58 (p 78 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-7675-9424		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 187				88.96%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.804	1.86	0.916	8	CDF	0.2224	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.61	2.29	0.8719	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.39204	0.39204	1	0.646	0.4448	Non-Significant Effect					
Error	4.85592	0.60699	8								
Total	5.24796		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.65	23.2	0.3677	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.933	0.741	0.4785	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	0.00%
31243-104		5	1.43	0.26	2.59	1.6	0.24	2.4	0.42	65.84%	-38.45%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.8	0.58	0.61	1.5	0.66					
31243-104		2.4	1.6	0.24	0.69	2.2					

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Report Date: 07 Feb-19 08:58 (p 79 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-4504-9367		Endpoint: PCB 187		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 187				58.68%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	-0.523	1.86	0.604	8	CDF	0.6924	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.59	2.29	0.9341	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.07225	0.07225	1	0.274	0.6151	Non-Significant Effect					
Error	2.1128	0.2641	8								
Total	2.18505		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.7	23.2	0.6207	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.903	0.741	0.2344	Normal Distribution				
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	0.00%
31243-105		5	0.86	0.311	1.41	1.1	0.24	1.3	0.198	51.45%	16.50%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	1.8	0.58	0.61	1.5	0.66					
31243-105		0.24	0.56	1.3	1.1	1.1					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-1876-5519		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 195	5.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-5792-3653		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 195				5.79%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.49	1.89	0.014	7	CDF	0.3197	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.722E-05	2.722E-05	1	0.24	0.6394	Non-Significant Effect					
Error	0.000795	0.0001136	7								
Total	0.0008222		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.98	24.3	0.5186	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.881	0.701	0.1596	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		4	0.237	0.217	0.258	0.24	0.22	0.25	0.00629	5.30%	-1.50%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		Outlier	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-8811-2549		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 195				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-5378-2959		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 195				3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1484	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.8	0.3972	Non-Significant Effect					
Error	0.0004	0.00005	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	23.2	0.2080	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.741	0.0337	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-5933-6910		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 195				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-9335-9036		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 206			5.95%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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 Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-1341-6090		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 206			5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.49	2.29	1.0000		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0		0	1	0	1.0000		Non-Significant Effect			
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.25	23.2	0.4515		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.826	0.741	0.0298		Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 17-6517-0670		Endpoint: PCB 206			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed pcb 206					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-3419-5473		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 206			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 89 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 16-9254-8177		Endpoint: PCB 206			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed pcb 206				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 90 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7537-8356		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 209				5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 91 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-4203-2272		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:52		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 209			5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.49	2.29	1.0000		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0		0	1	0	1.0000		Non-Significant Effect			
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.25	23.2	0.4515		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.826	0.741	0.0298		Normal Distribution				
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 92 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 03-1203-7495		Endpoint: PCB 209			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed pcb 209				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 93 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-5588-2269		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 209			3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 08:58 (p 94 of 94)
Test Code: 31250Nv-PCB | 12-5299-7080

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 06-6086-0310		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 8:53		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 209				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

Nereis virens
28 day Bioaccumulation Evaluation
Body Burden Data and Statistical Analysis
Pesticides

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Pre-Tissue					
	REP1	*	REP2	*	REP3	*
Pesticides (ng/g wet weight)						
Aldrin	0.24	U	0.24	U	0.23	U
cis-Chlordane	0.24	U	0.24	U	0.23	U
trans-Chlordane	0.24	U	0.24	U	0.23	U
cis-Nonachlor	0.24	U	0.24	U	0.23	U
trans-Nonachlor	0.24	U	0.24	U	0.23	U
Oxychlordane	0.47	U	0.47	U	0.46	U
Total Chlordanes	1.4		1.4		1.4	
4,4'-DDT	0.24	U	0.24	U	0.23	U
4,4'-DDD	0.24	U	0.24	U	0.23	U
4,4'-DDE	0.24	U	0.24	U	0.23	U
Total DDT	0.71		0.71		0.70	
Dieldrin	0.24	U	0.24	U	0.23	U
alpha-Endosulfan	0.24	U	0.24	U	0.23	U
beta-Endosulfan	0.24	U	0.24	U	0.23	U
Endosulfans	0.47		0.47		0.46	
Endrin	0.24	U	0.24	U	0.23	U
Heptachlor	0.24	U	0.24	U	0.23	U
Heptachlor epoxide	0.47	U	0.47	U	0.46	U
Hexachlorobenzene	0.47	U	0.47	U	0.46	U
Lindane	0.24	U	0.24	U	0.23	U
Methoxychlor	0.95	U	0.94	U	0.93	U
Toxaphene	12	U	12	U	12	U

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	CLDS Reference									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
cis-Chlordane	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
trans-Chlordane	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
cis-Nonachlor	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
trans-Nonachlor	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Oxychlordane	0.46	U	0.43	U	0.47	U	0.47	U	0.47	U
Total Chlordanes	1.4		1.3		1.4		1.4		1.4	
4,4'-DDT	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
4,4'-DDD	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
4,4'-DDE	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Total DDT	0.68		0.65		0.71		0.71		0.71	
Dieldrin	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
alpha-Endosulfan	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
beta-Endosulfan	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Endosulfans	0.46		0.43		0.47		0.47		0.47	
Endrin	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Heptachlor	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Heptachlor epoxide	0.46	U	0.43	U	0.47	U	0.47	U	0.47	U
Hexachlorobenzene	0.46	U	0.43	U	0.47	U	0.47	U	0.47	U
Lindane	0.23	U	0.22	U	0.24	U	0.24	U	0.24	U
Methoxychlor	0.91	U	0.86	U	0.95	U	0.95	U	0.95	U
Toxaphene	11	U	11	U	12	U	12	U	12	U

* = Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 2 (R',S')									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
cis-Chlordane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
trans-Chlordane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
cis-Nonachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
trans-Nonachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Oxychlordane	0.43	U	0.44	U	0.49	U	0.43	U	0.49	U
Total Chlordanes	1.3		1.3		1.5		1.3		1.5	
4,4'-DDT	0.22	U	1.2		0.25	U	0.22	U	0.24	U
4,4'-DDD	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
4,4'-DDE	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Total DDT	0.65		1.7		0.74		0.65		0.73	
Dieldrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
alpha-Endosulfan	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
beta-Endosulfan	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Endosulfans	0.43		0.44		0.49		0.43		0.49	
Endrin	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Heptachlor	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Heptachlor epoxide	0.43	U	0.44	U	0.49	U	0.43	U	0.49	U
Hexachlorobenzene	0.43	U	0.44	U	0.49	U	0.43	U	0.49	U
Lindane	0.22	U	0.22	U	0.25	U	0.22	U	0.24	U
Methoxychlor	0.87	U	0.88	U	0.99	U	0.87	U	0.98	U
Toxaphene	11	U	11	U	12	U	11	U	12	U

* = Qualifiers

U Analyte not detected; below the Method Detection Limit

J Analyte estimated; detection below the Method Detection Limit

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 3 (US-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
cis-Chlordane	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
trans-Chlordane	0.49		0.24	U	0.22	U	0.25	U	0.24	U
cis-Nonachlor	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
trans-Nonachlor	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Oxychlordane	0.45	U	0.48	U	0.43	U	0.50	U	0.48	U
Total Chlordanes	1.6		1.5		1.3		1.5		1.4	
4,4'-DDT	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
4,4'-DDD	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
4,4'-DDE	0.22	U	0.48		0.22	U	0.25	U	0.24	U
Total DDT	0.67		0.97		0.65		0.75		0.72	
Dieldrin	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
alpha-Endosulfan	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
beta-Endosulfan	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Endosulfans	0.45		0.48		0.43		0.50		0.48	
Endrin	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Heptachlor	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Heptachlor epoxide	0.45	U	0.48	U	0.43	U	0.50	U	0.48	U
Hexachlorobenzene	0.45	U	0.48	U	0.43	U	0.50	U	0.48	U
Lindane	0.22	U	0.24	U	0.22	U	0.25	U	0.24	U
Methoxychlor	0.90	U	0.97	U	0.87	U	1.0	U	0.96	U
Toxaphene	11	U	12	U	11	U	13	U	12	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
New Haven Harbor FNP 2018

CONTAMINANT	Composite 4 (DS-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.22	U	0.53		0.22	U	0.23	U	0.22	U
cis-Chlordane	0.22	U	1.6		0.22	U	0.23	U	0.22	U
trans-Chlordane	0.49		0.23	U	0.47		0.23	U	0.57	
cis-Nonachlor	0.22	U	1.5		0.22	U	0.23	U	0.22	U
trans-Nonachlor	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
Oxychlordane	0.45	U	0.45	U	0.44	U	0.46	U	0.44	U
Total Chlordanes	1.6		3.9		1.6		1.4		1.7	
4,4'-DDT	0.22	U	2.3		0.22	U	0.23	U	0.22	U
4,4'-DDD	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
4,4'-DDE	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
Total DDT	0.67		2.7		0.66		0.69		0.66	
Dieldrin	0.22	U	0.94		0.22	U	0.23	U	1.7	
alpha-Endosulfan	0.22	U	1.6		0.22	U	0.23	U	0.22	U
beta-Endosulfan	0.22	U	1.3		0.22	U	0.23	U	0.22	U
Endosulfans	0.45		2.9		0.44		0.46		0.44	
Endrin	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U
Heptachlor	0.22	U	0.65		0.22	U	0.23	U	0.22	U
Heptachlor epoxide	0.45	U	0.45	U	0.44	U	0.46	U	0.44	U
Hexachlorobenzene	0.45	U	4.5		0.44	U	0.46	U	0.44	U
Lindane	0.22	U	2.5		0.22	U	0.23	U	0.22	U
Methoxychlor	0.90	U	0.91	U	0.89	U	0.92	U	0.89	U
Toxaphene	11	U	11	U	11	U	12	U	11	U

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NA Not Analyzed

APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 5 (TB-1,-2)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
cis-Chlordane	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
trans-Chlordane	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
cis-Nonachlor	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
trans-Nonachlor	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Oxychlordane	0.48	U	0.47	U	0.48	U	0.48	U	0.47	U
Total Chlordanes	1.4		1.4		1.4		1.5		1.4	
4,4'-DDT	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
4,4'-DDD	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
4,4'-DDE	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Total DDT	0.72		0.70		0.72		0.73		0.71	
Dieldrin	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
alpha-Endosulfan	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
beta-Endosulfan	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Endosulfans	0.48		0.47		0.48		0.48		0.47	
Endrin	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Heptachlor	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Heptachlor epoxide	0.48	U	0.47	U	0.48	U	0.48	U	0.47	U
Hexachlorobenzene	0.48	U	0.47	U	0.48	U	0.48	U	0.47	U
Lindane	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U
Methoxychlor	0.97	U	0.93	U	0.96	U	0.97	U	0.95	U
Toxaphene	12	U	12	U	12	U	12	U	12	U

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APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*)
 New Haven Harbor FNP 2018

CONTAMINANT	Composite 6 (CAD-1,-2,-3)									
	REP1	*	REP2	*	REP3	*	REP4	*	REP5	*
Pesticides (ng/g wet weight)										
Aldrin	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
cis-Chlordane	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
trans-Chlordane	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
cis-Nonachlor	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
trans-Nonachlor	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Oxychlordane	0.48	U	0.47	U	0.45	U	0.46	U	0.47	U
Total Chlordanes	1.4		1.4		1.4		1.4		1.4	
4,4'-DDT	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
4,4'-DDD	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
4,4'-DDE	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Total DDT	0.72		0.71		0.68		0.69		0.70	
Dieldrin	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
alpha-Endosulfan	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
beta-Endosulfan	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Endosulfans	0.48		0.47		0.45		0.46		0.47	
Endrin	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Heptachlor	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Heptachlor epoxide	0.48	U	0.47	U	0.45	U	0.46	U	0.47	U
Hexachlorobenzene	0.48	U	0.47	U	0.45	U	0.46	U	0.47	U
Lindane	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Methoxychlor	0.96	U	0.95	U	0.90	U	0.92	U	0.93	U
Toxaphene	12	U	12	U	11	U	12	U	12	U

* = Qualifiers

U Analyte not detected; below Me

J Analyte estimated; detection be

NA Not Analyzed

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:16 (p 1 of 2)

Test Code/ID: 11-0894-3381/31250Nv-Pest

Bioaccumulation Evaluation - Pesticides - Nereis EnviroSystems, Inc.

Start Date: 20 Nov-18 12:04 Species: Nereis virens Sample Code: 31250-000
 End Date: 18 Dec-18 12:04 Protocol: US ACE NED RIM (2004) Sample Source: New Haven Harbor 2018
 Sample Date: 20 Nov-18 Material: Laboratory Control Sediment Sample Station: Laboratory Control (Nv)

Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha chlordane	alpha-BHC	beta-BHC	cis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlorane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs	
31242-008	1	6	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.46	0.46	0.91	0.46	11	0.23							
31242-008	2	8	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.43	0.43	0.86	0.43	11	0.22							
31242-008	3	13	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.47	0.47	0.95	0.47	12	0.24							
31242-008	4	24	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.47	0.47	0.95	0.47	12	0.24							
31242-008	5	29	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.47	0.47	0.95	0.47	12	0.24							
31243-101	1	1	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.43	0.43	0.87	0.43	11	0.22							
31243-101	2	7	0.22	0.22	1.2	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.88	0.44	11	0.22							
31243-101	3	18	0.25	0.25	0.25	0.25	0.25			0.25		0.25	0.25	0.25	0.25	0.25	0.25	0.49	0.49	0.99	0.49	12	0.25							
31243-101	4	23	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.43	0.43	0.87	0.43	11	0.22							
31243-101	5	25	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.98	0.49	12	0.24							
31243-102	1	2	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.49	0.22	0.45	0.45	0.9	0.45	11	0.22						
31243-102	2	12	0.24	0.48	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.97	0.48	12	0.24							
31243-102	3	17	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.22	0.43	0.43	0.87	0.43	11	0.22							
31243-102	4	20	0.25	0.25	0.25	0.25	0.25			0.25		0.25	0.25	0.25	0.25	0.25	0.25	0.5	0.5	1	0.5	13	0.25							
31243-102	5	27	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.96	0.48	12	0.24							
31243-103	1	5	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.49	0.22	0.45	0.45	0.9	0.45	11	0.22						
31243-103	2	11	0.23	0.23	2.3	0.53	1.6			1.5		0.94	1.6	1.3	0.23	2.45	0.23	0.65	0.45	4.5	0.91	0.45	11	0.23						
31243-103	3	16	0.22	0.22	0.22	0.22	0.22			0.22		0.22	0.22	0.22	0.22	0.22	0.47	0.22	0.44	0.44	0.89	0.44	11	0.22						
31243-103	4	21	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.46	0.46	0.92	0.46	12	0.23							
31243-103	5	28	0.22	0.22	0.22	0.22	0.22			0.22		1.7	0.22	0.22	0.22	0.22	0.57	0.22	0.44	0.44	0.89	0.44	11	0.22						
31243-104	1	3	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.97	0.48	12	0.24							
31243-104	2	9	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.47	0.47	0.93	0.47	12	0.23							
31243-104	3	14	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.96	0.48	12	0.24							
31243-104	4	19	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.97	0.48	12	0.24							
31243-104	5	26	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.47	0.47	0.95	0.47	12	0.24							
31243-105	1	4	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.48	0.48	0.96	0.48	12	0.24							
31243-105	2	10	0.24	0.24	0.24	0.24	0.24			0.24		0.24	0.24	0.24	0.24	0.24	0.24	0.47	0.47	0.95	0.47	12	0.24							
31243-105	3	15	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.45	0.45	0.9	0.45	11	0.23							
31243-105	4	22	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.46	0.46	0.92	0.46	12	0.23							

CETIS Test Data Worksheet

Report Date: 01 Feb-19 14:16 (p 2 of 2)

Test Code/ID: 11-0894-3381/31250Nv-Pest

Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha-chlordane	alpha-BHC	beta-BHC	dis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlordane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs
31243-105	5	30	0.23	0.23	0.23	0.23	0.23			0.23		0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.47	0.47	0.93	0.47	12	0.23					

CETIS Summary Report

Report Date: 07 Feb-19 09:46 (p 1 of 11)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis **EnviroSystems, Inc.**

Batch ID: 11-0180-7361	Test Type: Bioaccumulation - Pesticides	Analyst: Nancy Roka
Start Date: 20 Nov-18 12:04	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 18 Dec-18 12:04	Species: Nereis virens	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
13-2259-0600	4-4'-DDD	Equal Variance t Two-Sample Test	0.6962	31243-101 passed 4-4'-ddd
20-7450-0162	4-4'-DDD	Equal Variance t Two-Sample Test	0.5000	31243-102 passed 4-4'-ddd
20-3350-7522	4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed 4-4'-ddd
09-3401-9078	4-4'-DDD	Equal Variance t Two-Sample Test	0.1986	31243-104 passed 4-4'-ddd
17-4563-7129	4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed 4-4'-ddd
09-1272-1973	4-4'-DDE	Equal Variance t Two-Sample Test	0.6962	31243-101 passed 4-4'-dde
14-4250-0064	4-4'-DDE	Equal Variance t Two-Sample Test	0.5717	31243-102 passed 4-4'-dde
06-5140-7363	4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-102 passed 4-4'-dde
19-4387-9394	4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed 4-4'-dde
06-7844-8161	4-4'-DDE	Equal Variance t Two-Sample Test	0.1986	31243-104 passed 4-4'-dde
18-3686-3317	4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed 4-4'-dde
06-8125-3382	4-4'-DDT	Equal Variance t Two-Sample Test	0.5717	31243-101 passed 4-4'-ddt
10-0684-3690	4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	0.3452	31243-101 passed 4-4'-ddt
17-7612-2460	4-4'-DDT	Equal Variance t Two-Sample Test	0.5000	31243-102 passed 4-4'-ddt
01-5677-8978	4-4'-DDT	Equal Variance t Two-Sample Test	0.9718	31243-103 passed 4-4'-ddt
10-4151-3154	4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed 4-4'-ddt
02-5145-1433	4-4'-DDT	Equal Variance t Two-Sample Test	0.1986	31243-104 passed 4-4'-ddt
14-7456-8786	4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed 4-4'-ddt
00-0743-7141	aldrin	Equal Variance t Two-Sample Test	0.6962	31243-101 passed aldrin
15-8547-5674	aldrin	Equal Variance t Two-Sample Test	0.5000	31243-102 passed aldrin
12-8767-6472	aldrin	Equal Variance t Two-Sample Test	0.9718	31243-103 passed aldrin
06-2875-6493	aldrin	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed aldrin
17-3027-4126	aldrin	Equal Variance t Two-Sample Test	0.1986	31243-104 passed aldrin
20-9034-6982	aldrin	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed aldrin
21-0361-1579	alpha chlordane	Equal Variance t Two-Sample Test	0.6962	31243-101 passed alpha chlordane
19-8162-4708	alpha chlordane	Equal Variance t Two-Sample Test	0.5000	31243-102 passed alpha chlordane
00-4268-1296	alpha chlordane	Equal Variance t Two-Sample Test	0.9718	31243-103 passed alpha chlordane
13-8426-8534	alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed alpha chlordane
02-7408-3382	alpha chlordane	Equal Variance t Two-Sample Test	0.1986	31243-104 passed alpha chlordane
19-2454-8380	alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed alpha chlordane
16-7078-8408	cis-Nonachlor	Equal Variance t Two-Sample Test	0.6962	31243-101 passed cis-nonachlor
18-3793-2195	cis-Nonachlor	Equal Variance t Two-Sample Test	0.5000	31243-102 passed cis-nonachlor
19-0509-0003	cis-Nonachlor	Equal Variance t Two-Sample Test	0.9718	31243-103 passed cis-nonachlor

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Bioaccumulation Evaluation - Pesticides - Nereis **EnviroSystems, Inc.**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
12-9308-5278	cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed cis-nonachlor
02-3639-5533	cis-Nonachlor	Equal Variance t Two-Sample Test	0.1986	31243-104 passed cis-nonachlor
15-0025-6030	cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed cis-nonachlor
03-5240-2642	Dieldrin	Equal Variance t Two-Sample Test	0.6962	31243-101 passed dieldrin
06-8589-0863	Dieldrin	Equal Variance t Two-Sample Test	0.5000	31243-102 passed dieldrin
10-5616-4871	Dieldrin	Unequal Variance t Two-Sample Test	0.1098	31243-103 passed dieldrin
01-3657-9720	Dieldrin	Wilcoxon Rank Sum Two-Sample Test	0.7857	31243-103 passed dieldrin
10-6732-6334	Dieldrin	Equal Variance t Two-Sample Test	0.1986	31243-104 passed dieldrin
02-9691-9187	Dieldrin	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed dieldrin
03-6112-7330	endosulfan I	Equal Variance t Two-Sample Test	0.6962	31243-101 passed endosulfan i
18-9547-0886	endosulfan I	Equal Variance t Two-Sample Test	0.5000	31243-102 passed endosulfan i
03-6223-1867	endosulfan I	Equal Variance t Two-Sample Test	0.9718	31243-103 passed endosulfan i
17-6932-5855	endosulfan I	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed endosulfan i
12-6094-9099	endosulfan I	Equal Variance t Two-Sample Test	0.1986	31243-104 passed endosulfan i
12-2739-2656	endosulfan I	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed endosulfan i
15-3984-7736	endosulfan II	Equal Variance t Two-Sample Test	0.6962	31243-101 passed endosulfan ii
11-4783-1993	endosulfan II	Equal Variance t Two-Sample Test	0.5000	31243-102 passed endosulfan ii
04-5407-8903	endosulfan II	Equal Variance t Two-Sample Test	0.9718	31243-103 passed endosulfan ii
05-2092-1050	endosulfan II	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed endosulfan ii
04-5069-1753	endosulfan II	Equal Variance t Two-Sample Test	0.1986	31243-104 passed endosulfan ii
20-1227-0488	endosulfan II	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed endosulfan ii
12-1405-6338	endrin	Equal Variance t Two-Sample Test	0.6962	31243-101 passed endrin
02-2380-1284	endrin	Equal Variance t Two-Sample Test	0.5000	31243-102 passed endrin
00-0855-7669	endrin	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed endrin
12-7057-1957	endrin	Equal Variance t Two-Sample Test	0.1986	31243-104 passed endrin
09-9554-6834	endrin	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed endrin
17-3775-4041	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.6962	31243-101 passed gamma-bhc (lindane)
04-2713-7398	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.5000	31243-102 passed gamma-bhc (lindane)
11-8993-3305	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.9718	31243-103 passed gamma-bhc (lindane)
04-6997-9178	gamma-BHC (Lindane)	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed gamma-bhc (lindane)
16-1051-0947	gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	0.1986	31243-104 passed gamma-bhc (lindane)
04-0165-6874	gamma-BHC (Lindane)	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed gamma-bhc (lindane)
18-3808-0205	gamma-chlordane	Equal Variance t Two-Sample Test	0.6962	31243-101 passed gamma-chlordane
01-6355-1119	gamma-chlordane	Equal Variance t Two-Sample Test	0.3197	31243-102 passed gamma-chlordane
09-1235-2843	gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	0.1984	31243-102 passed gamma-chlordane
05-5493-9530	gamma-chlordane	Unequal Variance t Two-Sample Test	0.0406	31243-103 failed gamma-chlordane
04-9538-6964	gamma-chlordane	Equal Variance t Two-Sample Test	0.1986	31243-104 passed gamma-chlordane
03-8492-3918	gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed gamma-chlordane
09-0582-7478	heptachlor	Equal Variance t Two-Sample Test	0.6962	31243-101 passed heptachlor
06-2877-3240	heptachlor	Equal Variance t Two-Sample Test	0.5000	31243-102 passed heptachlor
05-6670-9601	heptachlor	Equal Variance t Two-Sample Test	0.9718	31243-103 passed heptachlor
15-3278-2036	heptachlor	Wilcoxon Rank Sum Two-Sample Test	0.8651	31243-103 passed heptachlor
11-9215-2155	heptachlor	Equal Variance t Two-Sample Test	0.1986	31243-104 passed heptachlor
18-5016-7173	heptachlor	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed heptachlor
08-3365-0892	heptachlor epoxide	Equal Variance t Two-Sample Test	0.5956	31243-101 passed heptachlor epoxide
09-4184-3626	heptachlor epoxide	Equal Variance t Two-Sample Test	0.2997	31243-102 passed heptachlor epoxide
07-0624-3782	heptachlor epoxide	Equal Variance t Two-Sample Test	0.9977	31243-103 passed heptachlor epoxide
18-9030-0064	heptachlor epoxide	Equal Variance t Two-Sample Test	0.8997	31243-103 passed heptachlor epoxide
05-4480-2154	heptachlor epoxide	Wilcoxon Rank Sum Two-Sample Test	0.0397	31243-104 failed heptachlor epoxide
06-4566-6242	heptachlor epoxide	Wilcoxon Rank Sum Two-Sample Test	0.0794	31243-104 passed heptachlor epoxide
12-7596-5081	heptachlor epoxide	Equal Variance t Two-Sample Test	0.2679	31243-105 passed heptachlor epoxide
07-6005-3732	hexachlorobenzene	Equal Variance t Two-Sample Test	0.5956	31243-101 passed hexachlorobenzene
11-7834-3319	hexachlorobenzene	Equal Variance t Two-Sample Test	0.2997	31243-102 passed hexachlorobenzene

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Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
20-4836-5019	hexachlorobenzene	Equal Variance t Two-Sample Test	0.8799	31243-103 passed hexachlorobenzene
15-4499-0488	hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	0.7460	31243-103 passed hexachlorobenzene
10-4908-2700	hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	0.0397	31243-104 failed hexachlorobenzene
12-5936-1132	hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	0.0794	31243-104 passed hexachlorobenzene
12-2147-5395	hexachlorobenzene	Equal Variance t Two-Sample Test	0.2679	31243-105 passed hexachlorobenzene
14-3745-4053	Methoxychlor	Equal Variance t Two-Sample Test	0.5705	31243-101 passed methoxychlor
05-7951-1571	Methoxychlor	Equal Variance t Two-Sample Test	0.3028	31243-102 passed methoxychlor
01-4989-4515	Methoxychlor	Equal Variance t Two-Sample Test	0.8633	31243-103 passed methoxychlor
05-1701-5240	Methoxychlor	Equal Variance t Two-Sample Test	0.9947	31243-103 passed methoxychlor
11-7113-0067	Methoxychlor	Equal Variance t Two-Sample Test	0.0678	31243-104 passed methoxychlor
14-9216-5923	Methoxychlor	Equal Variance t Two-Sample Test	0.3549	31243-105 passed methoxychlor
12-1297-3125	oxychlordane	Equal Variance t Two-Sample Test	0.5956	31243-101 passed oxychlordane
10-2008-4006	oxychlordane	Equal Variance t Two-Sample Test	0.2997	31243-102 passed oxychlordane
13-8440-9001	oxychlordane	Equal Variance t Two-Sample Test	0.8997	31243-103 passed oxychlordane
16-7773-6799	oxychlordane	Equal Variance t Two-Sample Test	0.9977	31243-103 passed oxychlordane
03-5450-3727	oxychlordane	Wilcoxon Rank Sum Two-Sample Test	0.0397	31243-104 failed oxychlordane
20-8290-7070	oxychlordane	Wilcoxon Rank Sum Two-Sample Test	0.0794	31243-104 passed oxychlordane
19-2482-4737	oxychlordane	Equal Variance t Two-Sample Test	0.2679	31243-105 passed oxychlordane
20-2730-5291	toxaphene	Equal Variance t Two-Sample Test	0.7102	31243-101 passed toxaphene
06-1356-0577	toxaphene	Equal Variance t Two-Sample Test	0.3333	31243-102 passed toxaphene
21-0102-4542	toxaphene	Equal Variance t Two-Sample Test	0.8792	31243-103 passed toxaphene
10-4893-4972	toxaphene	Equal Variance t Two-Sample Test	0.0706	31243-104 passed toxaphene
17-2804-1698	toxaphene	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-105 passed toxaphene
02-0519-3611	trans-nonachlor	Equal Variance t Two-Sample Test	0.6962	31243-101 passed trans-nonachlor
20-9178-4221	trans-nonachlor	Equal Variance t Two-Sample Test	0.5000	31243-102 passed trans-nonachlor
10-7621-4680	trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	0.9762	31243-103 passed trans-nonachlor
05-3537-4887	trans-nonachlor	Equal Variance t Two-Sample Test	0.1986	31243-104 passed trans-nonachlor
05-2691-1466	trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	0.6587	31243-105 passed trans-nonachlor

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Bioaccumulation Evaluation - Pesticides - Nereis											EnviroSystems, Inc.
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.282	0.144	0.42	0.22	0.48	0.0498	0.111	39.52%	-20.51%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.426	-0.111	0.963	0.22	1.2	0.194	0.433	101.61%	-82.05%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.638	-0.516	1.79	0.22	2.3	0.416	0.929	145.63%	-172.65%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.284	0.113	0.455	0.22	0.53	0.0615	0.138	48.45%	-21.37%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.498	-0.267	1.26	0.22	1.6	0.276	0.616	123.71%	-112.82%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.478	-0.231	1.19	0.22	1.5	0.256	0.571	119.53%	-104.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%

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Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.662	-0.155	1.48	0.22	1.7	0.294	0.658	99.40%	-182.91%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.498	-0.267	1.26	0.22	1.6	0.276	0.616	123.71%	-112.82%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.438	-0.16	1.04	0.22	1.3	0.216	0.482	110.02%	-87.18%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.668	-0.569	1.9	0.22	2.45	0.446	0.996	149.13%	-185.47%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.288	0.147	0.429	0.22	0.49	0.0507	0.113	39.39%	-23.08%
31243-103		5	0.398	0.202	0.594	0.23	0.57	0.0706	0.158	39.66%	-70.09%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%

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Bioaccumulation Evaluation - Pesticides - Nereis											EnviroSystems, Inc.
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.308	0.0706	0.545	0.22	0.65	0.0855	0.191	62.09%	-31.62%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.43	0.47	0.00775	0.0173	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.43	0.49	0.014	0.0313	6.87%	0.87%
31243-102		5	0.468	0.434	0.502	0.43	0.5	0.0124	0.0277	5.93%	-1.74%
31243-103		5	0.448	0.438	0.458	0.44	0.46	0.00374	0.00837	1.87%	2.61%
31243-104		5	0.476	0.469	0.483	0.47	0.48	0.00245	0.00548	1.15%	-3.48%
31243-105		5	0.466	0.452	0.48	0.45	0.48	0.0051	0.0114	2.45%	-1.30%
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.43	0.47	0.00775	0.0173	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.43	0.49	0.014	0.0313	6.87%	0.87%
31243-102		5	0.468	0.434	0.502	0.43	0.5	0.0124	0.0277	5.93%	-1.74%
31243-103		5	1.26	-0.992	3.51	0.44	4.5	0.811	1.81	144.07%	-173.48%
31243-104		5	0.476	0.469	0.483	0.47	0.48	0.00245	0.00548	1.15%	-3.48%
31243-105		5	0.466	0.452	0.48	0.45	0.48	0.0051	0.0114	2.45%	-1.30%
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.86	0.95	0.0178	0.0397	4.30%	0.00%
31243-101		5	0.918	0.842	0.994	0.87	0.99	0.0275	0.0614	6.69%	0.65%
31243-102		5	0.94	0.874	1.01	0.87	1	0.0239	0.0534	5.68%	-1.73%
31243-103		5	0.902	0.886	0.918	0.89	0.92	0.00583	0.013	1.45%	2.38%
31243-104		5	0.956	0.935	0.977	0.93	0.97	0.00748	0.0167	1.75%	-3.46%
31243-105		5	0.932	0.902	0.962	0.9	0.96	0.0107	0.0239	2.56%	-0.87%
oxychlorane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.43	0.47	0.00775	0.0173	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.43	0.49	0.014	0.0313	6.87%	0.87%
31243-102		5	0.468	0.434	0.502	0.43	0.5	0.0124	0.0277	5.93%	-1.74%
31243-103		5	0.448	0.438	0.458	0.44	0.46	0.00374	0.00837	1.87%	2.61%
31243-104		5	0.476	0.469	0.483	0.47	0.48	0.00245	0.00548	1.15%	-3.48%
31243-105		5	0.466	0.452	0.48	0.45	0.48	0.0051	0.0114	2.45%	-1.30%
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	11	12	0.245	0.548	4.72%	0.00%
31243-101		5	11.4	10.7	12.1	11	12	0.245	0.548	4.80%	1.72%
31243-102		5	11.8	10.8	12.8	11	13	0.374	0.837	7.09%	-1.72%
31243-103		5	11.2	10.6	11.8	11	12	0.2	0.447	3.99%	3.45%
31243-104		5	12	12	12	12	12	0	0	0.00%	-3.45%
31243-105		5	11.8	11.2	12.4	11	12	0.2	0.447	3.79%	-1.72%

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Bioaccumulation Evaluation - Pesticides - Nereis											EnviroSystems, Inc.
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	1.71%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	4.27%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-1.71%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	0.00%

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.
4-4'-DDD Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
4-4'-DDE Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.48	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
4-4'-DDT Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	1.2	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	2.3	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
aldrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.53	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
alpha chlordane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	1.6	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
cis-Nonachlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	1.5	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.
Dieldrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.94	0.22	0.23	1.7	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
endosulfan I Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	1.6	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
endosulfan II Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	1.3	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
endrin Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
gamma-BHC (Lindane) Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	2.45	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
gamma-chlordane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.49	0.24	0.22	0.25	0.24	
31243-103		0.49	0.23	0.47	0.23	0.57	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.
heptachlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.65	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
heptachlor epoxide Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.46	0.43	0.47	0.47	0.47	
31243-101		0.43	0.44	0.49	0.43	0.49	
31243-102		0.45	0.48	0.43	0.5	0.48	
31243-103		0.45	0.45	0.44	0.46	0.44	
31243-104		0.48	0.47	0.48	0.48	0.47	
31243-105		0.48	0.47	0.45	0.46	0.47	
hexachlorobenzene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.46	0.43	0.47	0.47	0.47	
31243-101		0.43	0.44	0.49	0.43	0.49	
31243-102		0.45	0.48	0.43	0.5	0.48	
31243-103		0.45	4.5	0.44	0.46	0.44	
31243-104		0.48	0.47	0.48	0.48	0.47	
31243-105		0.48	0.47	0.45	0.46	0.47	
Methoxychlor Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.91	0.86	0.95	0.95	0.95	
31243-101		0.87	0.88	0.99	0.87	0.98	
31243-102		0.9	0.97	0.87	1	0.96	
31243-103		0.9	0.91	0.89	0.92	0.89	
31243-104		0.97	0.93	0.96	0.97	0.95	
31243-105		0.96	0.95	0.9	0.92	0.93	
oxychlorodane Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	0.46	0.43	0.47	0.47	0.47	
31243-101		0.43	0.44	0.49	0.43	0.49	
31243-102		0.45	0.48	0.43	0.5	0.48	
31243-103		0.45	0.45	0.44	0.46	0.44	
31243-104		0.48	0.47	0.48	0.48	0.47	
31243-105		0.48	0.47	0.45	0.46	0.47	
toxaphene Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31242-008	RS	11	11	12	12	12	
31243-101		11	11	12	11	12	
31243-102		11	12	11	13	12	
31243-103		11	11	11	12	11	
31243-104		12	12	12	12	12	
31243-105		12	12	11	12	12	

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis						EnviroSystems, Inc.
trans-nonachlor Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31242-008	RS	0.23	0.22	0.24	0.24	0.24
31243-101		0.22	0.22	0.25	0.22	0.24
31243-102		0.22	0.24	0.22	0.25	0.24
31243-103		0.22	0.23	0.22	0.23	0.22
31243-104		0.24	0.23	0.24	0.24	0.24
31243-105		0.24	0.24	0.23	0.23	0.23

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 3	25.5		0.3452381	0.05	FALSE		8	2	E
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.1875523	1.89458	0.5717258	0.05	FALSE	0.0151524	7		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
gamma-chlordane	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.02975277	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.02975277	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.1834252	1.85955	0.5704859	0.05	FALSE	0.0608274	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.2499998	1.85955	0.5955562	0.05	FALSE	0.02975277	8		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5773503	1.85955	0.710208	0.05	FALSE	0.6441664	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 3	-0.5345224	1.85955	0.6962444	0.05	FALSE	0.01391558	8		C
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 4	25.5		0.3452381	0.05	FALSE		8	2	E
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs 4	-0.1875523	1.89458	0.5717258	0.05	FALSE	0.0151524	7		C
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 4	22.5		0.1984127	0.05	FALSE		8	2	E
gamma-chlordane	Equal Variance t Two-Sample Test	CLDS	vs 4	0.489584	1.89458	0.3196984	0.05	FALSE	0.0135442	7		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs 4	0.5468683	1.85955	0.2996936	0.05	FALSE	0.02720284	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs 4	0.5468683	1.85955	0.2996936	0.05	FALSE	0.02720284	8		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 4	0.5375304	1.85955	0.3027632	0.05	FALSE	0.05535084	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs 4	0.5468683	1.85955	0.2996936	0.05	FALSE	0.02720284	8		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs 4	0.4472136	1.85955	0.3332905	0.05	FALSE	0.8316151	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 4	0	1.85955	0.5	0.05	FALSE	0.01340939	8		C
4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	35.5		0.9761904	0.05	FALSE		8	2	E
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	35.5		0.9761904	0.05	FALSE		8	2	E
4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
aldrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
aldrin	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
Dieldrin	Unequal Variance t Two-Sample Test	CLDS	vs 5	1.454235	2.13185	0.1097804	0.05	FALSE	0.6274297	4		C
Dieldrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	22.5		0.7857143	0.05	FALSE		7	2	E
endosulfan I	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
endosulfan II	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
endrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	35.5		0.9761904	0.05	FALSE		8	2	E
gamma-BHC (Lindane)	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
gamma-chlordane	Unequal Variance t Two-Sample Test	CLDS	vs 5	2.31931	2.13185	0.0405991	0.05	TRUE	0.1507443	4		C
heptachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	32		0.8650793	0.05	FALSE		8	2	E
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs 5	-2.282139	1.89458	0.971771	0.05	FALSE	0.00954703	7		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs 5	-1.394973	1.85955	0.8997328	0.05	FALSE	0.01599644	8		C
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs 5	-4.081909	1.89458	0.9976608	0.05	FALSE	0.00905074	7		C
hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	30.5		0.7460318	0.05	FALSE		8	1	E
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs 5	-1.283681	1.89458	0.8799449	0.05	FALSE	0.0184487	7		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 5	-1.17595	1.85955	0.8632895	0.05	FALSE	0.03478895	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 5	-3.456587	1.89458	0.9947018	0.05	FALSE	0.02082806	7		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs 5	-1.394973	1.85955	0.8997328	0.05	FALSE	0.01599644	8		C
oxychlordane	Equal Variance t Two-Sample Test	CLDS	vs 5	-4.081909	1.89458	0.9976608	0.05	FALSE	0.00905074	7		C
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs 5	-1.264911	1.85955	0.879248	0.05	FALSE	0.5880407	8		C
trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 5	35.5		0.9761904	0.05	FALSE		8	2	E
4-4'-DDD	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDE	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
4-4'-DDT	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
aldrin	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
alpha chlordane	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
cis-Nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
Dieldrin	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
endosulfan I	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
endosulfan II	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
endrin	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
gamma-chlordane	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
heptachlor	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
heptachlor epoxide	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0396825	0.05	TRUE		8	1	E
heptachlor epoxide	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0793651	0.05	FALSE		7	1	E
hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0396825	0.05	TRUE		8	1	E
hexachlorobenzene	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0793651	0.05	FALSE		7	1	E
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 6	1.659123	1.85955	0.0678372	0.05	FALSE	0.03586566	8		C
oxychlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0396825	0.05	TRUE		8	1	E
oxychlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 6	18		0.0793651	0.05	FALSE		7	1	E
toxaphene	Equal Variance t Two-Sample Test	CLDS	vs 6	1.632993	1.85955	0.0705566	0.05	FALSE	0.4554944	8		C
trans-nonachlor	Equal Variance t Two-Sample Test	CLDS	vs 6	0.8944274	1.85955	0.1986019	0.05	FALSE	0.00831615	8		C
4-4'-DDD	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
4-4'-DDT	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
aldrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
alpha chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
Dieldrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
endosulfan I	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
endosulfan II	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
endrin	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
gamma-BHC (Lindane)	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
heptachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS	vs 7	28.5		0.6587301	0.05	FALSE		8	2	E
heptachlor epoxide	Equal Variance t Two-Sample Test	CLDS	vs 7	0.6469961	1.85955	0.2678765	0.05	FALSE	0.01724474	8		C
hexachlorobenzene	Equal Variance t Two-Sample Test	CLDS	vs 7	0.6469961	1.85955	0.2678765	0.05	FALSE	0.01724474	8		C
Methoxychlor	Equal Variance t Two-Sample Test	CLDS	vs 7	0.385794	1.85955	0.3548529	0.05	FALSE	0.0385604	8		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	Group 1	Group 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
oxychlordane	Equal Variance t Two-Sample Test	CLDS vs	7	0.6469961	1.85955	0.2678765	0.05	FALSE	0.01724474	8		C
toxaphene	Wilcoxon Rank Sum Two-Sample Test	CLDS vs	7	25		0.5	0.05	FALSE		8	2	E
trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	CLDS vs	7	28.5		0.6587301	0.05	FALSE		8	2	E

CETIS Analytical Report

Report Date: 07 Feb-19 09:42 (p 1 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-2259-0600		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed 4-4'-ddd			5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.907	0.741	0.2642		Normal Distribution				
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 09:42 (p 2 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-7450-0162		Endpoint: 4-4'-DDD			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed 4-4'-ddd				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 09:42 (p 3 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-3350-7522		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed 4-4'-ddd				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-3401-9078		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-104 passed 4-4'-ddd				3.55%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		2.1	2.29	0.1484		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4	23.2	0.2080		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.83	0.741	0.0337		Normal Distribution				
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-4563-7129		Endpoint: 4-4'-DDD		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed 4-4'-ddd			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
4-4'-DDD Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
4-4'-DDD Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-1272-1973		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed 4-4'-dde			5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.79	2.29	0.5093		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		2.5	23.2	0.3965		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.907	0.741	0.2642		Normal Distribution				
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-4250-0064		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed 4-4'-dde			6.48%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	-0.188	1.89	0.015	7	CDF	0.5717	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.000005		0.000005	1	0.0352	0.8565	Non-Significant Effect				
Error	0.000995		0.0001421	7							
Total	0.001			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.81	24.3	0.3434	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.701	0.1700	Normal Distribution				
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	0.64%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	Outlier	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-4387-9394		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed 4-4'-dde				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-7844-8161		Endpoint: 4-4'-DDE			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed 4-4'-dde					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-3686-3317		Endpoint: 4-4'-DDE		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed 4-4'-dde				3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
4-4'-DDE Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
4-4'-DDE Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-0684-3690		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-101 passed 4-4'-ddt			153.87%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	25.5	n/a	2	8	Exact	0.3452	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.6E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.09216	0.09216	1	0.983	0.3504	Non-Significant Effect					
Error	0.74984	0.09373	8								
Total	0.842		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2340	23.2	1.1E-06	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.646	0.741	2.0E-04	Non-Normal Distribution					
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.426	-0.111	0.963	0.24	0.22	1.2	0.194	101.61%	-82.05%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	1.2	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-8125-3382		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed 4-4'-ddt				6.48%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.188	1.89	0.015	7	CDF	0.5717	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.000005	0.000005	1	0.0352	0.8565	Non-Significant Effect					
Error	0.000995	0.0001421	7								
Total	0.001		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.81	24.3	0.3434	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.883	0.701	0.1700	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	0.64%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	Outlier	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-7612-2460		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed 4-4'-ddt				5.73%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.29	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.25	23.2	0.4515	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0298	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-4151-3154		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed 4-4'-ddt			330.21%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.40804	0.40804	1	0.945	0.3594	Non-Significant Effect					
Error	3.4532	0.43165	8								
Total	3.86124		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		10800	23.2	<1.0E-37	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.63	0.741	1.3E-04	Non-Normal Distribution					
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.638	-0.516	1.79	0.22	0.22	2.3	0.416	145.63%	-172.65%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	2.3	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-5145-1433		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed 4-4'-ddt				3.55%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1484	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.8	0.3972	Non-Significant Effect					
Error	0.0004	0.00005	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	23.2	0.2080	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.741	0.0337	Normal Distribution						
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-7456-8786		Endpoint: 4-4'-DDT		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed 4-4'-ddt			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
4-4'-DDT Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
4-4'-DDT Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-0743-7141		Endpoint: aldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed aldrin	5.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-8547-5674		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed aldrin				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-2875-6493		Endpoint: aldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed aldrin	49.00%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.68	2.29	5.1E-04	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00625	0.00625	1	0.658	0.4409	Non-Significant Effect					
Error	0.07604	0.009505	8								
Total	0.08229		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	237	23.2	1.1E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.658	0.741	2.7E-04	Non-Normal Distribution						
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.284	0.113	0.455	0.22	0.22	0.53	0.0615	48.45%	-21.37%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.53	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8767-6472		Endpoint: aldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed aldrin				4.08%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.28	1.89	0.01	7	CDF	0.9718	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0002939	0.0002939	1	5.21	0.0565	Non-Significant Effect					
Error	0.000395	5.643E-05	7								
Total	0.0006889		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.2	46.2	0.3666	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.856	0.701	0.0875	Normal Distribution						
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		4	0.223	0.215	0.23	0.22	0.22	0.23	0.0025	2.25%	4.91%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	Outlier	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-3027-4126		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed aldrin				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.8	0.3972		Non-Significant Effect			
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			4	23.2	0.2080		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337		Normal Distribution			
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-9034-6982		Endpoint: aldrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed aldrin				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
aldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0361-1579		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed alpha chlordane				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.286	0.6075		Non-Significant Effect			
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			2.5	23.2	0.3965		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642		Normal Distribution			
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-8162-4708		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed alpha chlordane				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-4268-1296		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed alpha chlordane				4.08%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.28	1.89	0.01	7	CDF	0.9718	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0002939		0.0002939	1	5.21	0.0565	Non-Significant Effect				
Error	0.000395		5.643E-05	7							
Total	0.0006889			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.2	46.2	0.3666	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.856	0.701	0.0875	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		4	0.223	0.215	0.23	0.22	0.22	0.23	0.0025	2.25%	4.91%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	Outlier	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-7408-3382		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed alpha chlordane				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-2454-8380		Endpoint: alpha chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed alpha chlordane				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
alpha chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
alpha chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7078-8408		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed cis-nonachlor				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-3793-2195		Endpoint:	cis-Nonachlor		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:02		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed cis-nonachlor				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 12-9308-5278		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed cis-nonachlor				203.07%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.14884	0.14884	1	0.912	0.3676	Non-Significant Effect					
Error	1.306	0.16325	8								
Total	1.45484		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		4080	23.2	3.6E-07	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.633	0.741	1.4E-04	Non-Normal Distribution					
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.478	-0.231	1.19	0.22	0.22	1.5	0.256	119.53%	-104.27%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	1.5	0.22	0.23	0.22					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-3639-5533		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed cis-nonachlor					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 15-0025-6030		Endpoint: cis-Nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed cis-nonachlor				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
cis-Nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
cis-Nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-5240-2642		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed dieldrin				5.95%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-8589-0863		Endpoint: Dieldrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed dieldrin				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-5616-4871		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed dieldrin	268.13%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	1.45	2.13	0.627	4	CDF	0.1098	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.37	2.29	0.0288	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.45796	0.45796	1	2.11	0.1840	Non-Significant Effect					
Error	1.7324	0.21655	8								
Total	2.19036		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5410	23.2	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.807	0.741	0.0178	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.662	-0.155	1.48	0.23	0.22	1.7	0.294	99.40%	-182.91%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.94	0.22	0.23	1.7					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-6732-6334		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed dieldrin	3.55%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.1	2.29	0.1484	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.8	0.3972	Non-Significant Effect					
Error	0.0004	0.00005	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	23.2	0.2080	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.83	0.741	0.0337	Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-9691-9187		Endpoint: Dieldrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed dieldrin			3.73%						
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
Dieldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-6112-7330		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed endosulfan i				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-9547-0886		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed endosulfan i				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-6932-5855		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed endosulfan i				218.96%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.17424	0.17424	1	0.918	0.3661	Non-Significant Effect					
Error	1.5184	0.1898	8								
Total	1.69264		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		4740	23.2	2.7E-07	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.633	0.741	1.4E-04	Non-Normal Distribution					
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.498	-0.267	1.26	0.22	0.22	1.6	0.276	123.71%	-112.82%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	1.6	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-6094-9099		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed endosulfan i					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 12-2739-2656		Endpoint: endosulfan I			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed endosulfan i				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
endosulfan I Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
endosulfan I Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-3984-7736		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed endosulfan ii				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-4783-1993		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed endosulfan ii				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 05-2092-1050		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed endosulfan ii				171.29%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.10404	0.10404	1	0.896	0.3716	Non-Significant Effect					
Error	0.9292	0.11615	8								
Total	1.03324		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2900	23.2	7.1E-07	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.635	0.741	1.4E-04	Non-Normal Distribution					
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.438	-0.16	1.04	0.22	0.22	1.3	0.216	110.02%	-87.18%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	1.3	0.22	0.23	0.22					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-5069-1753		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed endosulfan ii				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.8	0.3972		Non-Significant Effect			
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			4	23.2	0.2080		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337		Normal Distribution			
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-1227-0488		Endpoint: endosulfan II			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed endosulfan ii					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
endosulfan II Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
endosulfan II Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-1405-6338		Endpoint: endrin		CETIS Version: CETISv1.9.3							
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed endrin	5.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.79	2.29	0.5093	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00004	0.00004	1	0.286	0.6075	Non-Significant Effect					
Error	0.00112	0.00014	8								
Total	0.00116		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.5	23.2	0.3965	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.741	0.2642	Normal Distribution						
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-2380-1284		Endpoint: endrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed endrin					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-0855-7669		Endpoint: endrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 passed endrin				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7057-1957		Endpoint: endrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed endrin				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.8	0.3972		Non-Significant Effect			
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			4	23.2	0.2080		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337		Normal Distribution			
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 09-9554-6834		Endpoint: endrin			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed endrin			3.73%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
endrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
endrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-3775-4041		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed gamma-bhc (lindane)					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-2713-7398		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed gamma-bhc (lindane)				5.73%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00104	0.00013	8								
Total	0.00104		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	11-8993-3305		Endpoint:	gamma-BHC (Lindane)		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:03		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-103 passed gamma-bhc (lindane)			4.08%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.28	1.89	0.01	7	CDF	0.9718	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0002939		0.0002939		1	5.21	0.0565	Non-Significant Effect			
Error	0.000395		5.643E-05		7						
Total	0.0006889				8						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.2	46.2	0.3666	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.856	0.701	0.0875	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		4	0.223	0.215	0.23	0.22	0.22	0.23	0.0025	2.25%	4.91%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	Outlier	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-1051-0947		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed gamma-bhc (lindane)					3.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-0165-6874		Endpoint: gamma-BHC (Lindane)			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed gamma-bhc (lindane)				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2	2.29	0.2320	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.67	23.2	0.3651	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.781	0.741	0.0085	Non-Normal Distribution					
gamma-BHC (Lindane) Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
gamma-BHC (Lindane) Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-3808-0205		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed gamma-chlordane				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 09-1235-2843		Endpoint: gamma-chlordane				CETIS Version: CETISv1.9.3					
Analyzed: 07 Feb-19 9:02		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-102 passed gamma-chlordane				40.44%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	22.5	n/a	2	8	Exact	0.1984	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.66	2.29	7.0E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00729	0.00729	1	1.13	0.3196	Non-Significant Effect					
Error	0.0518	0.006475	8								
Total	0.05909		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		161	23.2	2.3E-04	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.697	0.741	8.2E-04	Non-Normal Distribution					
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.288	0.147	0.429	0.24	0.22	0.49	0.0507	39.39%	-23.08%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.49	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-5493-9530		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-103 failed gamma-chlordane				64.42%			
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103*	2.32	2.13	0.151	4	CDF	0.0406	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.63	2.29	0.8315	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.06724		0.06724	1	5.38	0.0490	Significant Effect				
Error	0.1		0.0125	8							
Total	0.16724			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			312	23.2	6.1E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.902	0.741	0.2278	Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.398	0.202	0.594	0.47	0.23	0.57	0.0706	39.66%	-70.09%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.49	0.23	0.47	0.23	0.57					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-9538-6964		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed gamma-chlordane				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.8	0.3972		Non-Significant Effect			
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			4	23.2	0.2080		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337		Normal Distribution			
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 03-8492-3918		Endpoint: gamma-chlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-105 passed gamma-chlordane					3.73%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
gamma-chlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
gamma-chlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-3365-0892		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed heptachlor epoxide				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.25	1.86	0.03	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.43	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00512		0.00064	8							
Total	0.00516			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.27	23.2	0.2781	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.741	0.2026	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.44	0.43	0.49	0.014	6.87%	0.87%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-101		0.43	0.44	0.49	0.43	0.49					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-4184-3626		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed heptachlor epoxide				5.91%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.547	1.86	0.027	8	CDF	0.2997	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.5989	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	0.299	0.5994	Non-Significant Effect				
Error	0.00428		0.000535	8							
Total	0.00444			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.57	23.2	0.3835	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.888	0.741	0.1593	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-102		5	0.468	0.434	0.502	0.48	0.43	0.5	0.0124	5.93%	-1.74%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-102		0.45	0.48	0.43	0.5	0.48					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	07-0624-3782		Endpoint:	heptachlor epoxide		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:03		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed heptachlor epoxide	1.94%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-4.08	1.89	0.009	7	CDF	0.9977	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.000845	0.000845	1	16.7	0.0047	Significant Effect					
Error	0.000355	5.071E-05	7								
Total	0.0012		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.8	46.2	0.4240	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.701	0.0496	Normal Distribution						
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.468	0.46	0.475	0.47	0.46	0.47	0.0025	1.07%	0.00%
31243-103		5	0.448	0.438	0.458	0.45	0.44	0.46	0.00374	1.87%	4.17%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	Outlier	0.47	0.47	0.47					
31243-103		0.45	0.45	0.44	0.46	0.44					

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Report Date: 07 Feb-19 12:52 (p 1 of 1)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-4480-2154		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 failed heptachlor epoxide					3.28%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	18	n/a	1	8	Exact	0.0397	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.48	2.29	0.0105	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00064	0.00064	1	3.88	0.0844	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00196		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			10	23.2	0.0466	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.782	0.741	0.0088	Non-Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-104		5	0.476	0.469	0.483	0.48	0.47	0.48	0.00245	1.15%	-3.48%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	06-4566-6242		Endpoint:	heptachlor epoxide			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 9:03		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-104 passed heptachlor epoxide					1.43%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	18	n/a	1	7	Exact	0.0794	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0001606	0.0001606	1	5.76	0.0474	Significant Effect					
Error	0.000195	2.786E-05	7								
Total	0.0003556		8								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.2	46.2	0.9174	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.738	0.701	0.0039	Non-Normal Distribution						
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.468	0.46	0.475	0.47	0.46	0.47	0.0025	1.07%	0.00%
31243-104		5	0.476	0.469	0.483	0.48	0.47	0.48	0.00245	1.15%	-1.82%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	Outlier	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Report Date: 07 Feb-19 09:43 (p 67 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7596-5081		Endpoint: heptachlor epoxide			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed heptachlor epoxide				3.75%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.647	1.86	0.017	8	CDF	0.2679	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.17	2.29	0.1033	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9E-05	9E-05	1	0.419	0.5358	Non-Significant Effect					
Error	0.00172	0.000215	8								
Total	0.00181		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.31	23.2	0.4379	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.86	0.741	0.0757	Normal Distribution				
heptachlor epoxide Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-105		5	0.466	0.452	0.48	0.47	0.45	0.48	0.0051	2.45%	-1.30%
heptachlor epoxide Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-105		0.48	0.47	0.45	0.46	0.47					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-0582-7478		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed heptachlor					5.95%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-2877-3240		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed heptachlor				5.73%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 15-3278-2036		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed heptachlor				68.04%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	32	n/a	2	8	Exact	0.8651	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.68	2.29	4.8E-04	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01369	0.01369	1	0.747	0.4126	Non-Significant Effect					
Error	0.1466	0.018325	8								
Total	0.16029		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			457	23.2	2.9E-05	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.649	0.741	2.1E-04	Non-Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.308	0.0706	0.545	0.22	0.22	0.65	0.0855	62.09%	-31.62%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.65	0.22	0.23	0.22					

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Report Date: 07 Feb-19 09:43 (p 71 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-6670-9601		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed heptachlor				4.08%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-2.28	1.89	0.01	7	CDF	0.9718	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0002939		0.0002939	1	5.21	0.0565	Non-Significant Effect				
Error	0.000395		5.643E-05	7							
Total	0.0006889			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.2	46.2	0.3666	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.856	0.701	0.0875	Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		4	0.223	0.215	0.23	0.22	0.22	0.23	0.0025	2.25%	4.91%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	Outlier	0.22	0.23	0.22					

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Report Date: 07 Feb-19 09:43 (p 72 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-9215-2155		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed heptachlor				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:5%)			
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484		No Outliers Detected			
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.00004		0.00004	1	0.8	0.3972		Non-Significant Effect			
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Variances	Variance Ratio F Test			4	23.2	0.2080		Equal Variances			
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337		Normal Distribution			
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 18-5016-7173		Endpoint: heptachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed heptachlor				3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
heptachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
heptachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6005-3732		Endpoint: hexachlorobenzene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed hexachlorobenzene				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.25	1.86	0.03	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.43	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00512		0.00064	8							
Total	0.00516			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.27	23.2	0.2781	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.741	0.2026	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.44	0.43	0.49	0.014	6.87%	0.87%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-101		0.43	0.44	0.49	0.43	0.49					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-7834-3319		Endpoint: hexachlorobenzene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-102 passed hexachlorobenzene				5.91%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.547	1.86	0.027	8	CDF	0.2997	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.74	2.29	0.5989	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	0.299	0.5994	Non-Significant Effect				
Error	0.00428		0.000535	8							
Total	0.00444			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.57	23.2	0.3835	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.888	0.741	0.1593	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-102		5	0.468	0.434	0.502	0.48	0.43	0.5	0.0124	5.93%	-1.74%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-102		0.45	0.48	0.43	0.5	0.48					

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Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 15-4499-0488		Endpoint: hexachlorobenzene				CETIS Version: CETISv1.9.3					
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed hexachlorobenzene				327.66%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	30.5	n/a	1	8	Exact	0.7460	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.68	2.29	4.4E-04	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.59201	1.59201	1	0.969	0.3537	Non-Significant Effect					
Error	13.1397	1.64246	8								
Total	14.7317		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		10900	23.2	<1.0E-37	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.63	0.741	1.3E-04	Non-Normal Distribution					
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-103		5	1.26	-0.992	3.51	0.45	0.44	4.5	0.811	144.07%	-173.48%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-103		0.45	4.5	0.44	0.46	0.44					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-4908-2700		Endpoint:	hexachlorobenzene			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 9:03		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-104 failed hexachlorobenzene					3.28%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	18	n/a	1	8	Exact	0.0397	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.48	2.29	0.0105	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00064	0.00064	1	3.88	0.0844	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00196		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	10	23.2	0.0466	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.782	0.741	0.0088	Non-Normal Distribution						
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-104		5	0.476	0.469	0.483	0.48	0.47	0.48	0.00245	1.15%	-3.48%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	12-5936-1132		Endpoint:	hexachlorobenzene		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:03		Analysis:	Nonparametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed hexachlorobenzene			1.43%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	18	n/a	1	7	Exact	0.0794	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0001606		0.0001606		1	5.76	0.0474	Significant Effect			
Error	0.000195		2.786E-05		7						
Total	0.0003556				8						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.2	46.2	0.9174	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.738	0.701	0.0039	Non-Normal Distribution					
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.468	0.46	0.475		0.46	0.47	0.0025	1.07%	0.00%
31243-104		5	0.476	0.469	0.483		0.47	0.48	0.00245	1.15%	-1.82%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	Outlier	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	12-2147-5395		Endpoint:	hexachlorobenzene		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:03		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed hexachlorobenzene				3.75%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.647	1.86	0.017	8	CDF	0.2679	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.17	2.29	0.1033	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	9E-05	9E-05	1	0.419	0.5358	Non-Significant Effect					
Error	0.00172	0.000215	8								
Total	0.00181		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.31	23.2	0.4379	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.86	0.741	0.0757	Normal Distribution				
hexachlorobenzene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-105		5	0.466	0.452	0.48	0.47	0.45	0.48	0.0051	2.45%	-1.30%
hexachlorobenzene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-105		0.48	0.47	0.45	0.46	0.47					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-3745-4053		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed methoxychlor				6.58%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.183	1.86	0.061	8	CDF	0.5705	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.48	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	9E-05		9E-05	1	0.0336	0.8590	Non-Significant Effect				
Error	0.0214		0.002675	8							
Total	0.02149			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.39	23.2	0.4203	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.91	0.741	0.2798	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.95	0.86	0.95	0.0178	4.30%	0.00%
31243-101		5	0.918	0.842	0.994	0.88	0.87	0.99	0.0275	6.69%	0.65%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.91	0.86	0.95	0.95	0.95					
31243-101		0.87	0.88	0.99	0.87	0.98					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-7951-1571		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed methoxychlor					5.99%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.538	1.86	0.055	8	CDF	0.3028	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.58	2.29	0.9636	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00064		0.00064	1	0.289	0.6055	Non-Significant Effect				
Error	0.01772		0.002215	8							
Total	0.01836			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.8	23.2	0.5818	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.879	0.741	0.1272	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.95	0.86	0.95	0.0178	4.30%	0.00%
31243-102		5	0.94	0.874	1.01	0.96	0.87	1	0.0239	5.68%	-1.73%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.91	0.86	0.95	0.95	0.95					
31243-102		0.9	0.97	0.87	1	0.96					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-4989-4515		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed methoxychlor					3.77%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-1.18	1.86	0.035	8	CDF	0.8633	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.29	2.29	0.0484	Outlier Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00121		0.00121	1	1.38	0.2734	Non-Significant Effect				
Error	0.007		0.000875	8							
Total	0.00821			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			9.29	23.2	0.0530	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.848	0.741	0.0542	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.95	0.86	0.95	0.0178	4.30%	0.00%
31243-103		5	0.902	0.886	0.918	0.9	0.89	0.92	0.00583	1.45%	2.38%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.91	0.86	0.95	0.95	0.95					
31243-103		0.9	0.91	0.89	0.92	0.89					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-7113-0067		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed methoxychlor				3.88%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.66	1.86	0.036	8	CDF	0.0678	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.23	2.29	0.0751	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00256		0.00256	1	2.75	0.1357	Non-Significant Effect				
Error	0.00744		0.00093	8							
Total	0.01			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.64	23.2	0.1223	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.864	0.741	0.0848	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.95	0.86	0.95	0.0178	4.30%	0.00%
31243-104		5	0.956	0.935	0.977	0.96	0.93	0.97	0.00748	1.75%	-3.46%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.91	0.86	0.95	0.95	0.95					
31243-104		0.97	0.93	0.96	0.97	0.95					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-9216-5923		Endpoint: Methoxychlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed methoxychlor				4.17%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.386	1.86	0.039	8	CDF	0.3549	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.07	2.29	0.1711	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00016		0.00016	1	0.149	0.7097	Non-Significant Effect				
Error	0.0086		0.001075	8							
Total	0.00876			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.77	23.2	0.3472	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.858	0.741	0.0724	Normal Distribution				
Methoxychlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.924	0.875	0.973	0.95	0.86	0.95	0.0178	4.30%	0.00%
31243-105		5	0.932	0.902	0.962	0.93	0.9	0.96	0.0107	2.56%	-0.87%
Methoxychlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.91	0.86	0.95	0.95	0.95					
31243-105		0.96	0.95	0.9	0.92	0.93					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-1297-3125		Endpoint: oxychlordan			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed oxychlordan				6.47%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.25	1.86	0.03	8	CDF	0.5956	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.43	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	4E-05		4E-05	1	0.0625	0.8089	Non-Significant Effect				
Error	0.00512		0.00064	8							
Total	0.00516			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.27	23.2	0.2781	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.897	0.741	0.2026	Normal Distribution				
oxychlordan Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-101		5	0.456	0.417	0.495	0.44	0.43	0.49	0.014	6.87%	0.87%
oxychlordan Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-101		0.43	0.44	0.49	0.43	0.49					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-2008-4006		Endpoint:	oxychlordane		CETIS Version:	CETISv1.9.3				
Analyzed:	07 Feb-19 9:02		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed oxychlordane			5.91%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.547	1.86	0.027	8	CDF	0.2997	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.74	2.29	0.5989	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00016	0.00016	1	0.299	0.5994	Non-Significant Effect					
Error	0.00428	0.000535	8								
Total	0.00444		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.57	23.2	0.3835	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.888	0.741	0.1593	Normal Distribution					
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-102		5	0.468	0.434	0.502	0.48	0.43	0.5	0.0124	5.93%	-1.74%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-102		0.45	0.48	0.43	0.5	0.48					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7773-6799		Endpoint: oxychlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-103 passed oxychlordane				1.94%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-4.08	1.89	0.009	7	CDF	0.9977	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.000845		0.000845	1	16.7	0.0047	Significant Effect				
Error	0.000355		5.071E-05	7							
Total	0.0012			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.8	46.2	0.4240	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.834	0.701	0.0496	Normal Distribution				
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.468	0.46	0.475	0.47	0.46	0.47	0.0025	1.07%	0.00%
31243-103		5	0.448	0.438	0.458	0.45	0.44	0.46	0.00374	1.87%	4.17%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	Outlier	0.47	0.47	0.47					
31243-103		0.45	0.45	0.44	0.46	0.44					

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Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis										EnviroSystems, Inc.	
Analysis ID: 03-5450-3727		Endpoint: oxychlordan			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-104 failed oxychlordan				3.28%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104*	18	n/a	1	8	Exact	0.0397	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.48	2.29	0.0105	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00064	0.00064	1	3.88	0.0844	Non-Significant Effect					
Error	0.00132	0.000165	8								
Total	0.00196		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		10	23.2	0.0466	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.782	0.741	0.0088	Non-Normal Distribution					
oxychlordan Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482		0.43	0.47	0.00775	3.77%	0.00%
31243-104		5	0.476	0.469	0.483		0.47	0.48	0.00245	1.15%	-3.48%
oxychlordan Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-8290-7070		Endpoint: oxychlordane			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed oxychlordane			1.43%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	18	n/a	1	7	Exact	0.0794	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0001606		0.0001606	1	5.76	0.0474	Significant Effect				
Error	0.000195		2.786E-05	7							
Total	0.0003556			8							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.2	46.2	0.9174	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.738	0.701	0.0039	Non-Normal Distribution				
oxychlordane Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	4	0.468	0.46	0.475	0.47	0.46	0.47	0.0025	1.07%	0.00%
31243-104		5	0.476	0.469	0.483	0.48	0.47	0.48	0.00245	1.15%	-1.82%
oxychlordane Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	Outlier	0.47	0.47	0.47					
31243-104		0.48	0.47	0.48	0.48	0.47					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-2482-4737		Endpoint: oxychlordan			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed oxychlordan				3.75%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	0.647	1.86	0.017	8	CDF	0.2679	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.17	2.29	0.1033	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	9E-05		9E-05	1	0.419	0.5358	Non-Significant Effect				
Error	0.00172		0.000215	8							
Total	0.00181			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.31	23.2	0.4379	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.86	0.741	0.0757	Normal Distribution				
oxychlordan Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.46	0.438	0.482	0.47	0.43	0.47	0.00775	3.77%	0.00%
31243-105		5	0.466	0.452	0.48	0.47	0.45	0.48	0.0051	2.45%	-1.30%
oxychlordan Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.46	0.43	0.47	0.47	0.47					
31243-105		0.48	0.47	0.45	0.46	0.47					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-2730-5291		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-101 passed toxaphene					5.55%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.577	1.86	0.644	8	CDF	0.7102	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.16	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.1	0.1	1	0.333	0.5796	Non-Significant Effect					
Error	2.4	0.3	8								
Total	2.5		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.799	0.741	0.0142	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-101		5	11.4	10.7	12.1	11	11	12	0.245	4.80%	1.72%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	11	12	12	12					
31243-101		11	11	12	11	12					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-1356-0577		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed toxaphene					7.17%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0.447	1.86	0.832	8	CDF	0.3333	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.8	2.29	0.4974	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.1		0.1	1	0.2	0.6666	Non-Significant Effect				
Error	4		0.5	8							
Total	4.1			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.33	23.2	0.4320	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.883	0.741	0.1411	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-102		5	11.8	10.8	12.8	12	11	13	0.374	7.09%	-1.72%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	11	12	12	12					
31243-102		11	12	11	13	12					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0102-4542		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-103 passed toxaphene					5.07%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	-1.26	1.86	0.588	8	CDF	0.8792	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.7	2.29	0.6884	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.4	0.4	1	1.6	0.2415	Non-Significant Effect					
Error	2	0.25	8								
Total	2.4		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.5	23.2	0.7040	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.89	0.741	0.1713	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-103		5	11.2	10.6	11.8	11	11	12	0.2	3.99%	3.45%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	11	12	12	12					
31243-103		11	11	11	12	11					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-4893-4972		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-104 passed toxaphene					3.93%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	1.63	1.86	0.455	8	CDF	0.0706	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.64	2.29	0.8052	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.4	0.4	1	2.67	0.1411	Non-Significant Effect					
Error	1.2	0.15	8								
Total	1.6		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Levene Equality of Variance Test			96	11.3	9.9E-06	Unequal Variances				
Variances	Mod Levene Equality of Variance Test			3	13.7	0.1340	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.814	0.741	0.0215	Normal Distribution				
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-104		5	12	12	12	12	12	12	0	0.00%	-3.45%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	11	12	12	12					
31243-104		12	12	12	12	12					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2804-1698		Endpoint: toxaphene			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed toxaphene				5.07%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	25	n/a	2	8	Exact	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.7	2.29	0.6884	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.1	0.1	1	0.4	0.5447	Non-Significant Effect					
Error	2	0.25	8								
Total	2.1		9								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.5	23.2	0.7040	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.759	0.741	0.0045	Non-Normal Distribution					
toxaphene Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	11.6	10.9	12.3	12	11	12	0.245	4.72%	0.00%
31243-105		5	11.8	11.2	12.4	12	11	12	0.2	3.79%	-1.72%
toxaphene Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	11	11	12	12	12					
31243-105		12	12	11	12	12					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-0519-3611		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-101 passed trans-nonachlor				5.95%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-101	-0.535	1.86	0.014	8	CDF	0.6962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.79	2.29	0.5093	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.286	0.6075	Non-Significant Effect				
Error	0.00112		0.00014	8							
Total	0.00116			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.5	23.2	0.3965	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.907	0.741	0.2642	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	1.71%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-9178-4221		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:02		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31243-102 passed trans-nonachlor					5.73%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-102	0	1.86	0.013	8	CDF	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.29	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0		0	1	0	1.0000	Non-Significant Effect				
Error	0.00104		0.00013	8							
Total	0.00104			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.25	23.2	0.4515	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.826	0.741	0.0298	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	0.00%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID:	10-7621-4680		Endpoint:	trans-nonachlor			CETIS Version:	CETISv1.9.3			
Analyzed:	07 Feb-19 9:03		Analysis:	Nonparametric-Two Sample			Official Results:	Yes			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result					PMSD				
Untransformed	C < T	31243-103 passed trans-nonachlor					3.73%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-103	35.5	n/a	2	8	Exact	0.9762	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.29	0.2320	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.00025	0.00025	1	4.55	0.0656	Non-Significant Effect					
Error	0.00044	0.000055	8								
Total	0.00069		9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.67	23.2	0.3651	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.781	0.741	0.0085	Non-Normal Distribution						
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	4.27%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-3537-4887		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed trans-nonachlor				3.55%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-104	0.894	1.86	0.008	8	CDF	0.1986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.1	2.29	0.1484	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.00004		0.00004	1	0.8	0.3972	Non-Significant Effect				
Error	0.0004		0.00005	8							
Total	0.00044			9							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4	23.2	0.2080	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.83	0.741	0.0337	Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-1.71%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 07 Feb-19 09:43 (p 98 of 98)
Test Code: 31250Nv-Pest | 11-0894-3381

Bioaccumulation Evaluation - Pesticides - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-2691-1466		Endpoint: trans-nonachlor			CETIS Version: CETISv1.9.3						
Analyzed: 07 Feb-19 9:03		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed trans-nonachlor				3.73%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		31243-105	28.5	n/a	2	8	Exact	0.6587	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2	2.29	0.2320	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	0.00044	5.5E-05	8								
Total	0.00044		9								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.67	23.2	0.3651	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.781	0.741	0.0085	Non-Normal Distribution				
trans-nonachlor Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	0.00%
trans-nonachlor Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31242-008	RS	0.23	0.22	0.24	0.24	0.24					
31243-105		0.24	0.24	0.23	0.23	0.23					

Nereis virens
28 day Bioaccumulation Evaluation

Statistical Analysis

Evaluation of PCB Congeners in Pre-Tissue
Summary Report

CETIS Test Data Worksheet

Report Date: 22 Mar-19 13:00 (p 1 of 2)

Test Code/ID: 09-6971-0849/31250Nv-PCB PRE

Bioaccumulation Evaluation - PCB Congeners - Nereis **EnviroSystems, Inc.**

Start Date: 20 Nov-18 12:05 **Species:** Nereis virens **Sample Code:** 31250-000
End Date: 18 Dec-18 12:05 **Protocol:** US ACE NED RIM (2004) **Sample Source:** New Haven Harbor 2018
Sample Date: 20 Nov-18 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control (Nv)

Sample	Rep	Pos	PCB 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 183	PCB 184	Total PCBs
31250-PRE	1	7	0.24	0.24	0.24	0.24	0.24	0.24	0.5	0.24	0.24	0.24	1.8	2.6	0.88	2.5	2.1	0.24	0.24	0.24	0.24	0.24	0.83	0.24	
31250-PRE	2	12	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	2.3	2.6	1	2.7	1.8	0.24	0.24	0.24	0.24	0.24	0.88	0.24	
31250-PRE	3	20	1.7	5.3	0.23	0.23	0.58	0.23	0.53	0.23	0.23	0.23	2.8	4.2	1.7	3.8	2.9	0.23	0.23	0.23	0.23	0.61	1	0.23	
31242-008	1	1	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.4	2.1	0.76	2.3	1.8	0.23	0.23	0.23	0.23	0.23	0.63	0.23	
31242-008	2	8	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.92	1.4	0.22	0.82	0.58	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
31242-008	3	21	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.82	1.3	0.24	1.2	0.61	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31242-008	4	27	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.4	2.1	0.54	1.8	1.5	0.24	0.24	0.24	0.24	0.24	0.24	0.52	0.24
31242-008	5	33	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.87	1.6	0.24	1.1	0.66	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31243-101	1	3	0.22	0.22	0.22	0.22	0.5	0.22	0.22	0.22	0.22	0.22	1.2	1.4	0.22	1.2	0.77	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
31243-101	2	13	0.22	1	0.22	0.22	0.69	0.22	0.51	0.48	0.22	0.46	3.3	5.5	2.6	5.9	3.7	0.22	0.22	0.22	0.22	0.22	1.4	0.22	0.22
31243-101	3	15	0.25	0.25	0.25	0.25	0.82	0.25	0.25	0.25	0.25	0.25	1.4	1.8	0.25	1.6	0.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
31243-101	4	25	0.22	0.22	0.22	0.22	0.53	0.22	0.22	0.22	0.22	0.22	1.9	3.3	0.83	3.5	2.4	0.22	0.22	0.22	0.22	0.22	1	0.22	0.22
31243-101	5	30	0.24	0.24	0.24	0.24	0.64	0.24	0.6	0.24	0.24	0.24	1.9	3.3	1.4	3.2	1.7	0.24	0.24	0.24	0.24	0.24	0.99	0.24	0.24
31243-102	1	5	0.22	0.22	0.22	0.22	0.59	0.22	0.63	0.59	0.22	0.22	3.4	5.8	2.3	5.6	3.8	0.69	0.22	0.22	0.22	0.22	1.7	0.22	0.22
31243-102	2	9	0.24	0.24	0.24	0.24	0.24	0.24	0.57	0.24	0.24	0.24	1.9	3.2	1.1	2.8	2	0.24	0.24	0.24	0.24	0.24	0.76	0.24	0.24
31243-102	3	17	0.22	0.22	0.22	0.22	0.22	0.22	0.6	0.22	0.22	0.22	1.1	1.7	0.22	1.3	0.88	0.22	0.22	0.22	0.22	0.22	0.44	0.22	0.22
31243-102	4	22	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1.6	2.5	0.86	2.6	1.9	0.25	0.25	0.25	0.25	0.25	0.87	0.25	0.25
31243-102	5	28	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.2	1.9	0.24	1.6	1.1	0.24	0.24	0.24	0.24	0.24	0.56	0.24	0.24
31243-103	1	2	0.22	1.7	0.22	0.22	0.82	0.22	0.71	0.22	0.22	0.22	2.4	3.8	1.3	3.6	2.4	0.22	0.22	0.22	0.22	0.22	0.96	0.22	0.22
31243-103	2	11	0.23	1.3	0.23	0.23	1.1	0.23	0.69	0.23	0.23	0.23	2.1	2.6	0.23	2.1	1.7	0.23	0.23	0.23	0.23	0.23	0.76	0.23	0.23
31243-103	3	16	1.7	2.1	0.22	0.22	1.1	0.22	0.99	0.22	0.22	0.22	1.9	2.4	0.22	1.6	1.6	0.22	0.22	0.22	0.22	1.3	0.6	0.22	0.22
31243-103	4	26	0.23	0.23	0.23	0.23	0.61	0.23	0.23	0.23	0.23	0.23	1.4	2.4	0.23	1.7	1.6	0.23	0.23	0.23	0.23	0.23	0.58	0.23	0.23
31243-103	5	32	0.22	0.22	0.22	0.22	1.3	0.22	1.3	0.22	0.22	0.22	5	7.5	3.5	7.4	4.8	0.22	0.22	0.22	0.22	0.22	2.1	0.22	0.22
31243-104	1	4	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.24	0.24	0.24	2.5	3.7	1.5	3.7	2.4	0.24	0.24	0.24	0.24	0.24	1.1	0.24	0.24
31243-104	2	14	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.5	2.5	0.72	2.2	1.6	0.23	0.23	0.23	0.23	0.23	0.67	0.23	0.23
31243-104	3	18	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.61	1.1	0.24	0.98	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31243-104	4	24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.1	1.7	0.76	0.85	0.69	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31243-104	5	31	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1.8	3.2	1.4	3.1	2.2	0.24	0.24	0.24	0.24	0.24	0.86	0.24	0.24
31243-105	1	6	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.69	1.3	0.24	0.64	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31243-105	2	10	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.86	1.3	0.24	0.64	0.56	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
31243-105	3	19	0.23	3.5	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.3	2	0.23	1.4	1.3	0.23	0.23	0.23	0.23	0.23	0.55	0.23	0.23

CETIS Test Data Worksheet

Report Date: 22 Mar-19 13:00 (p 2 of 2)

Test Code/ID: 09-6971-0849/31250Nv-PCB PRE

Sample	Rep	Pos	PCB 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 133	PCB 184	Total PCBs	
31243-105	4	23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.3	2	0.23	1.6	1.1	0.23	0.23	0.23	0.23	0.23	0.23	0.51	0.23	
31243-105	5	29	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.5	2.7	0.23	1.9	1.1	0.23	0.23	0.23	0.23	0.23	0.23	0.53	0.23	

CETIS Summary Report

Report Date: 04 Apr-19 12:30 (p 1 of 17)
 Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis EnviroSystems, Inc.

Batch ID: 06-9346-2173	Test Type: Bioaccumulation - PCBs - Nv	Analyst:
Start Date: 20 Nov-18 12:05	Protocol: US ACE NED RIM (2004)	Diluent: Not Applicable
Ending Date: 18 Dec-18 12:05	Species: Nereis virens	Brine: Not Applicable
Duration: 28d 0h	Source: ARO - Aquatic Research Organisms, NH	Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h		
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h		
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h		
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h		
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018	
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL	
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')	
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)	
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
11-1731-4129	PCB 008	Equal Variance t Two-Sample Test	0.2056	31250-PRE passed pcb 008
16-6463-1400	PCB 008	Equal Variance t Two-Sample Test	0.7944	31250-PRE passed pcb 008
04-1392-4581	PCB 008	Unequal Variance t Two-Sample Test	0.2090	31250-PRE passed pcb 008
12-2272-2322	PCB 008	Unequal Variance t Two-Sample Test	0.7910	31250-PRE passed pcb 008
01-9626-3663	PCB 008	Equal Variance t Two-Sample Test	0.1940	31243-101 passed pcb 008
02-6122-1401	PCB 008	Equal Variance t Two-Sample Test	0.8060	31243-101 passed pcb 008
12-6502-5890	PCB 008	Unequal Variance t Two-Sample Test	0.7926	31243-101 passed pcb 008
16-3032-1435	PCB 008	Unequal Variance t Two-Sample Test	0.2074	31243-101 passed pcb 008
02-9399-3902	PCB 008	Equal Variance t Two-Sample Test	0.2881	31243-102 passed pcb 008
09-8597-1190	PCB 008	Equal Variance t Two-Sample Test	0.7119	31243-102 passed pcb 008
10-3328-6464	PCB 008	Unequal Variance t Two-Sample Test	0.7910	31243-102 passed pcb 008
20-8866-5544	PCB 008	Unequal Variance t Two-Sample Test	0.2090	31243-102 passed pcb 008
08-3621-9758	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.9643	31243-103 passed pcb 008
12-4022-3320	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.1071	31243-103 passed pcb 008
01-2736-0287	PCB 008	Unequal Variance t Two-Sample Test	0.2105	31243-104 passed pcb 008
11-8383-5061	PCB 008	Unequal Variance t Two-Sample Test	0.7895	31243-104 passed pcb 008
00-1819-6195	PCB 008	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-104 passed pcb 008
03-1910-8620	PCB 008	Wilcoxon Rank Sum Two-Sample Test	0.2857	31243-104 passed pcb 008
11-6574-6891	PCB 008	Equal Variance t Two-Sample Test	0.8984	31243-105 passed pcb 008
12-3379-2665	PCB 008	Equal Variance t Two-Sample Test	0.1016	31243-105 passed pcb 008
15-1650-0720	PCB 008	Unequal Variance t Two-Sample Test	0.7910	31243-105 passed pcb 008
16-1254-9447	PCB 008	Unequal Variance t Two-Sample Test	0.2090	31243-105 passed pcb 008
02-6127-5834	PCB 018	Equal Variance t Two-Sample Test	0.2056	31250-PRE passed pcb 018
10-8290-0868	PCB 018	Equal Variance t Two-Sample Test	0.7944	31250-PRE passed pcb 018
09-5994-7382	PCB 018	Unequal Variance t Two-Sample Test	0.2106	31250-PRE passed pcb 018
13-6294-5151	PCB 018	Unequal Variance t Two-Sample Test	0.7894	31250-PRE passed pcb 018
15-7298-9691	PCB 018	Unequal Variance t Two-Sample Test	0.7705	31243-101 passed pcb 018
19-8581-6908	PCB 018	Unequal Variance t Two-Sample Test	0.2295	31243-101 passed pcb 018
06-3945-9699	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.5714	31243-101 passed pcb 018
20-1930-8030	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.5714	31243-101 passed pcb 018
12-0505-3529	PCB 018	Equal Variance t Two-Sample Test	0.7119	31243-102 passed pcb 018

CETIS Summary Report

Report Date: 04 Apr-19 12:30 (p 2 of 17)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis **EnviroSystems, Inc.**

Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
21-0581-7559	PCB 018	Equal Variance t Two-Sample Test	0.2881	31243-102 passed pcb 018
00-1289-7371	PCB 018	Unequal Variance t Two-Sample Test	0.7894	31243-102 passed pcb 018
07-9627-8980	PCB 018	Unequal Variance t Two-Sample Test	0.2106	31243-102 passed pcb 018
02-9230-6681	PCB 018	Equal Variance t Two-Sample Test	0.7187	31243-103 passed pcb 018
14-3237-9494	PCB 018	Equal Variance t Two-Sample Test	0.2813	31243-103 passed pcb 018
02-2865-3392	PCB 018	Unequal Variance t Two-Sample Test	0.2111	31243-104 passed pcb 018
17-7100-4239	PCB 018	Unequal Variance t Two-Sample Test	0.7889	31243-104 passed pcb 018
06-4088-3503	PCB 018	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-104 passed pcb 018
15-8891-1039	PCB 018	Wilcoxon Rank Sum Two-Sample Test	0.2857	31243-104 passed pcb 018
12-9481-2471	PCB 018	Equal Variance t Two-Sample Test	0.7416	31243-105 passed pcb 018
15-6611-4994	PCB 018	Equal Variance t Two-Sample Test	0.2584	31243-105 passed pcb 018
11-0851-9689	PCB 028	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 028
18-6877-6721	PCB 028	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 028
12-4603-9902	PCB 028	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 028
13-6535-1711	PCB 028	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 028
03-3618-4710	PCB 028	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 028
13-5662-3983	PCB 028	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 028
02-7695-8583	PCB 028	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 028
08-2465-2932	PCB 028	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 028
03-9515-5571	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 028
18-6476-5983	PCB 028	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 028
05-1953-9604	PCB 028	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 028
12-8947-7173	PCB 028	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 028
04-4011-7580	PCB 044	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 044
15-7582-8798	PCB 044	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 044
11-7695-8104	PCB 044	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 044
15-6191-9723	PCB 044	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 044
01-9205-0687	PCB 044	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 044
15-3196-7285	PCB 044	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 044
01-1873-2135	PCB 044	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 044
05-3704-9490	PCB 044	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 044
00-1667-7877	PCB 044	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 044
01-7002-6104	PCB 044	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 044
02-4903-3854	PCB 044	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 044
16-6410-3315	PCB 044	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 044
02-4833-7926	PCB 049	Equal Variance t Two-Sample Test	0.7944	31250-PRE passed pcb 049
14-8211-5390	PCB 049	Equal Variance t Two-Sample Test	0.2056	31250-PRE passed pcb 049
05-6307-8864	PCB 049	Unequal Variance t Two-Sample Test	0.2023	31250-PRE passed pcb 049
16-2506-6576	PCB 049	Unequal Variance t Two-Sample Test	0.7977	31250-PRE passed pcb 049
00-6667-4502	PCB 049	Equal Variance t Two-Sample Test	0.1940	31243-101 passed pcb 049
15-7402-6428	PCB 049	Equal Variance t Two-Sample Test	0.8060	31243-101 passed pcb 049
00-0331-6155	PCB 049	Unequal Variance t Two-Sample Test	0.8034	31243-101 passed pcb 049
20-5809-1109	PCB 049	Unequal Variance t Two-Sample Test	0.1966	31243-101 passed pcb 049
16-7640-7424	PCB 049	Equal Variance t Two-Sample Test	0.7119	31243-102 passed pcb 049
18-8045-3716	PCB 049	Equal Variance t Two-Sample Test	0.2881	31243-102 passed pcb 049
07-1425-1637	PCB 049	Unequal Variance t Two-Sample Test	0.2024	31243-102 passed pcb 049
19-7671-6749	PCB 049	Unequal Variance t Two-Sample Test	0.7976	31243-102 passed pcb 049
08-8456-6088	PCB 049	Unequal Variance t Two-Sample Test	0.1894	31243-103 passed pcb 049
21-1712-6071	PCB 049	Unequal Variance t Two-Sample Test	0.8106	31243-103 passed pcb 049
11-4097-3921	PCB 049	Wilcoxon Rank Sum Two-Sample Test	0.1071	31243-103 passed pcb 049
18-0401-9607	PCB 049	Wilcoxon Rank Sum Two-Sample Test	0.9107	31243-103 passed pcb 049
16-0455-4103	PCB 049	Unequal Variance t Two-Sample Test	0.7917	31243-104 passed pcb 049
16-6505-8892	PCB 049	Unequal Variance t Two-Sample Test	0.2083	31243-104 passed pcb 049

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Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
04-2889-7160	PCB 049	Wilcoxon Rank Sum Two-Sample Test	0.2857	31243-104 passed pcb 049
21-2185-8339	PCB 049	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-104 passed pcb 049
06-1578-4729	PCB 049	Equal Variance t Two-Sample Test	0.8984	31243-105 passed pcb 049
12-2437-0143	PCB 049	Equal Variance t Two-Sample Test	0.1016	31243-105 passed pcb 049
03-3985-1591	PCB 049	Unequal Variance t Two-Sample Test	0.2022	31243-105 passed pcb 049
08-8096-4662	PCB 049	Unequal Variance t Two-Sample Test	0.7978	31243-105 passed pcb 049
08-4043-1727	PCB 052	Equal Variance t Two-Sample Test	0.7944	31250-PRE passed pcb 052
12-6675-8257	PCB 052	Equal Variance t Two-Sample Test	0.2056	31250-PRE passed pcb 052
08-5476-6910	PCB 052	Unequal Variance t Two-Sample Test	0.7985	31250-PRE passed pcb 052
21-0760-4360	PCB 052	Unequal Variance t Two-Sample Test	0.2015	31250-PRE passed pcb 052
18-2037-4713	PCB 052	Equal Variance t Two-Sample Test	0.0232	31243-101 failed pcb 052
20-5236-9159	PCB 052	Equal Variance t Two-Sample Test	0.9768	31243-101 passed pcb 052
19-3675-2760	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.5000	31243-102 passed pcb 052
20-0527-1558	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.6250	31243-102 passed pcb 052
15-4078-9690	PCB 052	Equal Variance t Two-Sample Test	0.9935	31243-103 passed pcb 052
15-9297-7348	PCB 052	Equal Variance t Two-Sample Test	0.0065	31243-103 failed pcb 052
03-6606-4674	PCB 052	Unequal Variance t Two-Sample Test	0.2080	31243-104 passed pcb 052
12-6951-2205	PCB 052	Unequal Variance t Two-Sample Test	0.7920	31243-104 passed pcb 052
06-1160-7720	PCB 052	Wilcoxon Rank Sum Two-Sample Test	1.0000	31243-104 passed pcb 052
18-1697-9429	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.2857	31243-104 passed pcb 052
08-6652-3427	PCB 052	Equal Variance t Two-Sample Test	0.1016	31243-105 passed pcb 052
13-6470-2914	PCB 052	Equal Variance t Two-Sample Test	0.8984	31243-105 passed pcb 052
08-1214-0960	PCB 052	Unequal Variance t Two-Sample Test	0.7986	31243-105 passed pcb 052
12-9098-3043	PCB 052	Unequal Variance t Two-Sample Test	0.2014	31243-105 passed pcb 052
04-6770-1202	PCB 066	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 066
19-3533-1568	PCB 066	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 066
15-2392-8953	PCB 066	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 066
16-7170-0415	PCB 066	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 066
02-1312-6889	PCB 066	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 066
04-4044-0214	PCB 066	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 066
09-0830-2414	PCB 066	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 066
13-9176-3271	PCB 066	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 066
08-3308-5023	PCB 066	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 066
11-8120-8955	PCB 066	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 066
06-3170-0822	PCB 066	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 066
09-9084-9490	PCB 066	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 066
11-9586-4993	PCB 087	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 087
19-1559-8824	PCB 087	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 087
14-7103-7565	PCB 087	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 087
14-9175-4320	PCB 087	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 087
12-9363-8593	PCB 087	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 087
16-3794-1071	PCB 087	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 087
07-6949-1907	PCB 087	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 087
15-4703-1074	PCB 087	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 087
15-4893-9961	PCB 087	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 087
18-8935-4439	PCB 087	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 087
12-7727-3257	PCB 087	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 087
12-8956-7835	PCB 087	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 087
14-6608-9820	PCB 101	Equal Variance t Two-Sample Test	6.5E-07	31250-PRE failed pcb 101
18-9346-3996	PCB 101	Equal Variance t Two-Sample Test	1.0000	31250-PRE passed pcb 101
07-6773-3876	PCB 101	Unequal Variance t Two-Sample Test	0.0882	31250-PRE passed pcb 101
14-0285-2610	PCB 101	Unequal Variance t Two-Sample Test	0.9118	31250-PRE passed pcb 101
00-0607-6238	PCB 101	Equal Variance t Two-Sample Test	0.3182	31243-101 passed pcb 101

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Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
04-3648-6600	PCB 101	Equal Variance t Two-Sample Test	0.6818	31243-101 passed pcb 101
00-2295-8550	PCB 101	Equal Variance t Two-Sample Test	0.4027	31243-102 passed pcb 101
12-0591-5961	PCB 101	Equal Variance t Two-Sample Test	0.5973	31243-102 passed pcb 101
01-0092-2394	PCB 101	Equal Variance t Two-Sample Test	0.0965	31243-103 passed pcb 101
20-2063-5820	PCB 101	Equal Variance t Two-Sample Test	0.9035	31243-103 passed pcb 101
09-1543-2493	PCB 101	Equal Variance t Two-Sample Test	0.7812	31243-104 passed pcb 101
17-2710-9473	PCB 101	Equal Variance t Two-Sample Test	0.2188	31243-104 passed pcb 101
16-2460-0283	PCB 101	Equal Variance t Two-Sample Test	3.1E-07	31243-105 failed pcb 101
17-4870-6640	PCB 101	Equal Variance t Two-Sample Test	1.0000	31243-105 passed pcb 101
03-5009-8305	PCB 101	Unequal Variance t Two-Sample Test	0.0881	31243-105 passed pcb 101
03-5490-5118	PCB 101	Unequal Variance t Two-Sample Test	0.9119	31243-105 passed pcb 101
10-3031-7633	PCB 105	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 105
10-3767-0684	PCB 105	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 105
14-6302-6090	PCB 105	Equal Variance t Two-Sample Test	0.3365	31243-101 passed pcb 105
20-0712-0798	PCB 105	Equal Variance t Two-Sample Test	0.6635	31243-101 passed pcb 105
14-4553-1894	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.5536	31243-101 passed pcb 105
15-0947-0538	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.4464	31243-101 passed pcb 105
03-5061-3277	PCB 105	Equal Variance t Two-Sample Test	0.5397	31243-102 passed pcb 105
05-8181-1156	PCB 105	Equal Variance t Two-Sample Test	0.4603	31243-102 passed pcb 105
00-3321-5252	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-102 passed pcb 105
11-8288-1687	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.8036	31243-102 passed pcb 105
10-5339-5549	PCB 105	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 105
20-3776-3551	PCB 105	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 105
09-6550-0772	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 105
21-4601-8788	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 105
01-7903-2805	PCB 105	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 105
10-3069-6391	PCB 105	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 105
06-4883-1646	PCB 118	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 118
17-2733-3052	PCB 118	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 118
10-7109-1936	PCB 118	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 118
21-1302-4000	PCB 118	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 118
14-9313-1393	PCB 118	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 118
18-4672-3626	PCB 118	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 118
04-9015-6574	PCB 118	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 118
05-0217-3648	PCB 118	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 118
01-9050-5807	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 118
14-3729-9492	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 118
01-0246-5856	PCB 118	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 118
17-2215-1397	PCB 118	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 118
09-2357-8811	PCB 128	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 128
20-3313-7922	PCB 128	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 128
08-3338-8905	PCB 128	Equal Variance t Two-Sample Test	0.3365	31243-101 passed pcb 128
13-4415-7155	PCB 128	Equal Variance t Two-Sample Test	0.6635	31243-101 passed pcb 128
00-3605-7721	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.5536	31243-101 passed pcb 128
16-4252-2609	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.4464	31243-101 passed pcb 128
12-6295-4681	PCB 128	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 128
16-5336-3698	PCB 128	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 128
10-9748-5825	PCB 128	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 128
15-6953-1812	PCB 128	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 128
06-5580-8036	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 128
16-2957-8151	PCB 128	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 128
09-9700-4941	PCB 128	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 128
18-7460-0483	PCB 128	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 128

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Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
00-7594-5544	PCB 138	Equal Variance t Two-Sample Test	0.9978	31250-PRE passed pcb 138
21-0616-4546	PCB 138	Equal Variance t Two-Sample Test	0.0022	31250-PRE failed pcb 138
09-2830-2611	PCB 138	Equal Variance t Two-Sample Test	0.7378	31243-101 passed pcb 138
11-1832-3678	PCB 138	Equal Variance t Two-Sample Test	0.2622	31243-101 passed pcb 138
04-1901-5139	PCB 138	Equal Variance t Two-Sample Test	0.2336	31243-102 passed pcb 138
20-0750-3037	PCB 138	Equal Variance t Two-Sample Test	0.7664	31243-102 passed pcb 138
04-3743-5270	PCB 138	Equal Variance t Two-Sample Test	0.6127	31243-103 passed pcb 138
07-2535-7460	PCB 138	Equal Variance t Two-Sample Test	0.3873	31243-103 passed pcb 138
10-4840-5897	PCB 138	Equal Variance t Two-Sample Test	0.8205	31243-103 passed pcb 138
20-8323-0757	PCB 138	Equal Variance t Two-Sample Test	0.1795	31243-103 passed pcb 138
03-2838-0565	PCB 138	Equal Variance t Two-Sample Test	0.9279	31243-104 passed pcb 138
14-3341-4701	PCB 138	Equal Variance t Two-Sample Test	0.0721	31243-104 passed pcb 138
06-2006-5530	PCB 138	Equal Variance t Two-Sample Test	0.0035	31243-105 failed pcb 138
19-2921-8550	PCB 138	Equal Variance t Two-Sample Test	0.9965	31243-105 passed pcb 138
10-2651-2170	PCB 153	Equal Variance t Two-Sample Test	0.9905	31250-PRE passed pcb 153
12-7576-6898	PCB 153	Equal Variance t Two-Sample Test	0.0095	31250-PRE failed pcb 153
05-9570-4308	PCB 153	Equal Variance t Two-Sample Test	0.5270	31243-101 passed pcb 153
13-5393-6278	PCB 153	Equal Variance t Two-Sample Test	0.4730	31243-101 passed pcb 153
08-7667-9269	PCB 153	Equal Variance t Two-Sample Test	0.4593	31243-102 passed pcb 153
10-0518-2513	PCB 153	Equal Variance t Two-Sample Test	0.5407	31243-102 passed pcb 153
09-1571-0929	PCB 153	Equal Variance t Two-Sample Test	0.3353	31243-103 passed pcb 153
09-5160-5836	PCB 153	Equal Variance t Two-Sample Test	0.6647	31243-103 passed pcb 153
09-8567-7399	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.9143	31243-103 passed pcb 153
21-0253-9215	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.1143	31243-103 passed pcb 153
12-1436-9938	PCB 153	Equal Variance t Two-Sample Test	0.1935	31243-104 passed pcb 153
13-2647-1869	PCB 153	Equal Variance t Two-Sample Test	0.8065	31243-104 passed pcb 153
04-0099-7436	PCB 153	Equal Variance t Two-Sample Test	0.9746	31243-105 passed pcb 153
18-3012-2560	PCB 153	Equal Variance t Two-Sample Test	0.0254	31243-105 failed pcb 153
03-3009-6749	PCB 170	Equal Variance t Two-Sample Test	0.9924	31250-PRE passed pcb 170
05-1890-1653	PCB 170	Equal Variance t Two-Sample Test	0.0076	31250-PRE failed pcb 170
04-3123-7262	PCB 170	Equal Variance t Two-Sample Test	0.5819	31243-101 passed pcb 170
12-0551-9882	PCB 170	Equal Variance t Two-Sample Test	0.4181	31243-101 passed pcb 170
05-4080-3907	PCB 170	Equal Variance t Two-Sample Test	0.3303	31243-102 passed pcb 170
06-6479-7362	PCB 170	Equal Variance t Two-Sample Test	0.6697	31243-102 passed pcb 170
05-2046-5564	PCB 170	Equal Variance t Two-Sample Test	0.4572	31243-103 passed pcb 170
17-9143-2609	PCB 170	Equal Variance t Two-Sample Test	0.5428	31243-103 passed pcb 170
03-4525-4266	PCB 170	Wilcoxon Rank Sum Two-Sample Test	0.9429	31243-103 passed pcb 170
13-5624-9896	PCB 170	Wilcoxon Rank Sum Two-Sample Test	0.1143	31243-103 passed pcb 170
02-2948-5235	PCB 170	Equal Variance t Two-Sample Test	0.7566	31243-104 passed pcb 170
19-3515-1922	PCB 170	Equal Variance t Two-Sample Test	0.2434	31243-104 passed pcb 170
03-8648-4225	PCB 170	Unequal Variance t Two-Sample Test	0.9730	31243-105 passed pcb 170
10-3374-0487	PCB 170	Unequal Variance t Two-Sample Test	0.9679	31243-105 passed pcb 170
12-9166-5711	PCB 170	Unequal Variance t Two-Sample Test	0.0321	31243-105 failed pcb 170
18-2306-9694	PCB 170	Unequal Variance t Two-Sample Test	0.0270	31243-105 failed pcb 170
00-8924-2370	PCB 180	Equal Variance t Two-Sample Test	0.0076	31250-PRE failed pcb 180
05-6061-6757	PCB 180	Equal Variance t Two-Sample Test	0.9924	31250-PRE passed pcb 180
10-4295-7295	PCB 180	Equal Variance t Two-Sample Test	0.4734	31243-101 passed pcb 180
12-2721-0564	PCB 180	Equal Variance t Two-Sample Test	0.5266	31243-101 passed pcb 180
06-7894-8349	PCB 180	Equal Variance t Two-Sample Test	0.5791	31243-102 passed pcb 180
14-6166-5807	PCB 180	Equal Variance t Two-Sample Test	0.4209	31243-102 passed pcb 180
04-7663-0908	PCB 180	Equal Variance t Two-Sample Test	0.8518	31243-103 passed pcb 180
06-5821-0785	PCB 180	Equal Variance t Two-Sample Test	0.1482	31243-103 passed pcb 180
09-3430-4088	PCB 180	Equal Variance t Two-Sample Test	0.4283	31243-103 passed pcb 180

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Single Comparison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
18-6914-7352	PCB 180	Equal Variance t Two-Sample Test	0.5717	31243-103 passed pcb 180
08-2098-3420	PCB 180	Equal Variance t Two-Sample Test	0.8291	31243-104 passed pcb 180
10-9969-9122	PCB 180	Equal Variance t Two-Sample Test	0.1709	31243-104 passed pcb 180
07-1812-0907	PCB 180	Equal Variance t Two-Sample Test	0.0039	31243-105 failed pcb 180
17-7383-6251	PCB 180	Equal Variance t Two-Sample Test	0.9961	31243-105 passed pcb 180
04-7538-5209	PCB 183	Equal Variance t Two-Sample Test	0.0022	31250-PRE failed pcb 183
13-7792-2768	PCB 183	Equal Variance t Two-Sample Test	0.9978	31250-PRE passed pcb 183
11-7573-1430	PCB 183	Equal Variance t Two-Sample Test	0.6564	31243-101 passed pcb 183
15-1197-2026	PCB 183	Equal Variance t Two-Sample Test	0.3436	31243-101 passed pcb 183
03-2921-9989	PCB 183	Equal Variance t Two-Sample Test	0.9499	31243-102 passed pcb 183
05-3744-1812	PCB 183	Equal Variance t Two-Sample Test	0.0501	31243-102 passed pcb 183
09-7021-6501	PCB 183	Equal Variance t Two-Sample Test	0.4522	31243-102 passed pcb 183
11-0718-8224	PCB 183	Equal Variance t Two-Sample Test	0.5478	31243-102 passed pcb 183
04-5453-7674	PCB 183	Equal Variance t Two-Sample Test	0.4037	31243-103 passed pcb 183
11-2654-0239	PCB 183	Equal Variance t Two-Sample Test	0.5963	31243-103 passed pcb 183
16-8137-2925	PCB 183	Equal Variance t Two-Sample Test	0.9132	31243-103 passed pcb 183
17-2890-6957	PCB 183	Equal Variance t Two-Sample Test	0.0868	31243-103 passed pcb 183
06-5927-8654	PCB 183	Equal Variance t Two-Sample Test	0.8665	31243-104 passed pcb 183
18-2675-3602	PCB 183	Equal Variance t Two-Sample Test	0.1335	31243-104 passed pcb 183
08-5933-2442	PCB 183	Equal Variance t Two-Sample Test	0.0015	31243-105 failed pcb 183
14-5350-5683	PCB 183	Equal Variance t Two-Sample Test	0.9985	31243-105 passed pcb 183
11-9273-4658	PCB 184	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 184
20-7316-3279	PCB 184	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 184
08-5981-0283	PCB 184	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 184
16-8062-8481	PCB 184	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 184
07-4383-4381	PCB 184	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 184
20-0938-3976	PCB 184	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 184
05-6745-6763	PCB 184	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 184
12-7215-3017	PCB 184	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 184
16-9734-7726	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 184
18-7557-8631	PCB 184	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 184
16-1375-7949	PCB 184	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 184
16-7214-7736	PCB 184	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 184
12-8246-2816	PCB 187	Equal Variance t Two-Sample Test	0.9872	31250-PRE passed pcb 187
18-0403-2376	PCB 187	Equal Variance t Two-Sample Test	0.0128	31250-PRE failed pcb 187
11-3346-2507	PCB 187	Equal Variance t Two-Sample Test	0.3134	31243-101 passed pcb 187
17-5957-0471	PCB 187	Equal Variance t Two-Sample Test	0.6866	31243-101 passed pcb 187
05-1509-2227	PCB 187	Equal Variance t Two-Sample Test	0.3325	31243-102 passed pcb 187
14-3800-4211	PCB 187	Equal Variance t Two-Sample Test	0.6675	31243-102 passed pcb 187
00-4593-6450	PCB 187	Equal Variance t Two-Sample Test	0.5684	31243-103 passed pcb 187
05-2254-3262	PCB 187	Equal Variance t Two-Sample Test	0.8644	31243-103 passed pcb 187
13-7742-2054	PCB 187	Equal Variance t Two-Sample Test	0.1356	31243-103 passed pcb 187
17-3753-3198	PCB 187	Equal Variance t Two-Sample Test	0.4316	31243-103 passed pcb 187
05-8235-7475	PCB 187	Equal Variance t Two-Sample Test	0.1084	31243-104 passed pcb 187
18-1257-3872	PCB 187	Equal Variance t Two-Sample Test	0.8916	31243-104 passed pcb 187
11-7418-0783	PCB 187	Equal Variance t Two-Sample Test	0.0038	31243-105 failed pcb 187
21-2981-2114	PCB 187	Equal Variance t Two-Sample Test	0.9962	31243-105 passed pcb 187
15-3081-6491	PCB 195	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 195
15-7513-9225	PCB 195	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 195
02-4488-6918	PCB 195	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 195
02-7546-3061	PCB 195	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 195
01-3457-4129	PCB 195	Equal Variance t Two-Sample Test	0.5397	31243-102 passed pcb 195
19-1370-2237	PCB 195	Equal Variance t Two-Sample Test	0.4603	31243-102 passed pcb 195

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Bioaccumulation Evaluation - PCB Congeners - Nereis					EnviroSystems, Inc.
Single Comparison Summary					
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	
14-8057-4355	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.8036	31243-102 passed pcb 195	
20-2903-6545	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.3214	31243-102 passed pcb 195	
13-6436-6607	PCB 195	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 195	
16-7805-3667	PCB 195	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 195	
05-7084-7074	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 195	
20-2639-9419	PCB 195	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 195	
11-6825-5763	PCB 195	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 195	
16-4211-0443	PCB 195	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 195	
16-8623-1722	PCB 206	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 206	
18-3184-1824	PCB 206	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 206	
00-1218-6888	PCB 206	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 206	
16-0890-0996	PCB 206	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 206	
07-6035-2536	PCB 206	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 206	
19-7236-7314	PCB 206	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 206	
05-8052-7394	PCB 206	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 206	
08-8919-6924	PCB 206	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 206	
03-5842-3134	PCB 206	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 206	
11-1891-8588	PCB 206	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 206	
01-0662-5839	PCB 206	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 206	
16-9484-6159	PCB 206	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 206	
12-3902-9504	PCB 209	Equal Variance t Two-Sample Test	0.6674	31250-PRE passed pcb 209	
14-4647-9393	PCB 209	Equal Variance t Two-Sample Test	0.3326	31250-PRE passed pcb 209	
10-1873-0411	PCB 209	Equal Variance t Two-Sample Test	0.2381	31243-101 passed pcb 209	
17-6605-9929	PCB 209	Equal Variance t Two-Sample Test	0.7619	31243-101 passed pcb 209	
01-6195-0269	PCB 209	Equal Variance t Two-Sample Test	0.6197	31243-102 passed pcb 209	
13-1565-6816	PCB 209	Equal Variance t Two-Sample Test	0.3803	31243-102 passed pcb 209	
00-2761-8212	PCB 209	Equal Variance t Two-Sample Test	0.0104	31243-103 failed pcb 209	
08-2763-4262	PCB 209	Equal Variance t Two-Sample Test	0.9896	31243-103 passed pcb 209	
07-5955-6352	PCB 209	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 209	
17-7582-9539	PCB 209	Wilcoxon Rank Sum Two-Sample Test	0.6429	31243-104 passed pcb 209	
07-5406-5358	PCB 209	Equal Variance t Two-Sample Test	0.2685	31243-105 passed pcb 209	
14-2868-6187	PCB 209	Equal Variance t Two-Sample Test	0.7315	31243-105 passed pcb 209	

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Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	1.7	0.487	0.843	116.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	67.80%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	68.35%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	67.80%
31243-103		5	0.52	-0.299	1.34	0.22	1.7	0.295	0.66	126.86%	28.44%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	67.25%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	67.80%
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	5.3	1.69	2.92	151.63%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	87.85%
31243-101		5	0.386	-0.0405	0.812	0.22	1	0.154	0.343	88.99%	79.97%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	87.85%
31243-103		5	1.11	0.0472	2.17	0.22	2.1	0.383	0.856	77.12%	42.39%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	87.65%
31243-105		5	0.888	-0.925	2.7	0.23	3.5	0.653	1.46	164.43%	53.91%
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.61	0.123	0.214	58.79%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	35.60%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	36.70%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	35.60%
31243-103		5	0.44	-0.157	1.04	0.22	1.3	0.215	0.481	109.27%	-21.10%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	34.50%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	35.60%

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PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.58	0.113	0.196	55.56%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	33.77%
31243-101		5	0.636	0.476	0.796	0.5	0.82	0.0577	0.129	20.28%	-80.00%
31243-102		5	0.308	0.112	0.504	0.22	0.59	0.0707	0.158	51.30%	12.83%
31243-103		5	0.986	0.65	1.32	0.61	1.3	0.121	0.271	27.47%	-179.06%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	32.64%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	33.77%
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.24	0.53	0.0921	0.159	37.67%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	44.72%
31243-101		5	0.36	0.135	0.585	0.22	0.6	0.0811	0.181	50.35%	14.96%
31243-102		5	0.458	0.215	0.701	0.24	0.63	0.0875	0.196	42.71%	-8.19%
31243-103		5	0.784	0.291	1.28	0.23	1.3	0.177	0.397	50.62%	-85.20%
31243-104		5	0.318	0.0944	0.542	0.23	0.64	0.0805	0.18	56.62%	24.88%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	44.72%
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.282	0.144	0.42	0.22	0.48	0.0498	0.111	39.52%	-19.15%
31243-102		5	0.308	0.112	0.504	0.22	0.59	0.0707	0.158	51.30%	-30.14%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%

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PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.278	0.151	0.405	0.22	0.46	0.0459	0.103	36.89%	-17.46%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	1.8	2.8	0.289	0.5	21.74%	0.00%
31242-008	RS	5	1.08	0.719	1.45	0.82	1.4	0.131	0.292	27.03%	52.96%
31243-101		5	1.94	0.921	2.96	1.2	3.3	0.367	0.82	42.29%	15.65%
31243-102		5	1.84	0.687	2.99	1.1	3.4	0.415	0.929	50.49%	20.00%
31243-103		5	2.56	0.807	4.31	1.4	5	0.631	1.41	55.15%	-11.30%
31243-104		5	1.5	0.615	2.39	0.61	2.5	0.32	0.715	47.57%	34.70%
31243-105		5	1.13	0.708	1.55	0.69	1.5	0.152	0.34	30.05%	50.87%
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	4.2	0.533	0.924	29.48%	0.00%
31242-008	RS	5	1.7	1.23	2.17	1.3	2.1	0.17	0.381	22.40%	45.74%
31243-101		5	3.06	1.06	5.06	1.4	5.5	0.722	1.61	52.72%	2.34%
31243-102		5	3.02	0.958	5.08	1.7	5.8	0.743	1.66	54.98%	3.62%
31243-103		5	3.74	1.03	6.45	2.4	7.5	0.975	2.18	58.32%	-19.36%
31243-104		5	2.44	1.12	3.76	1.1	3.7	0.475	1.06	43.53%	22.13%
31243-105		5	1.86	1.13	2.59	1.3	2.7	0.262	0.586	31.49%	40.64%
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	0.88	1.7	0.256	0.443	37.11%	0.00%
31242-008	RS	5	0.4	0.1	0.7	0.22	0.76	0.108	0.241	60.31%	66.48%
31243-101		5	1.06	-0.166	2.29	0.22	2.6	0.442	0.988	93.17%	11.17%
31243-102		5	0.944	-0.111	2	0.22	2.3	0.38	0.85	90.04%	20.89%
31243-103		5	1.1	-0.67	2.86	0.22	3.5	0.636	1.42	129.74%	8.16%
31243-104		5	0.924	0.274	1.57	0.24	1.5	0.234	0.523	56.62%	22.57%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	80.39%

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Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.5	3.8	0.404	0.7	23.33%	0.00%
31242-008	RS	5	1.44	0.702	2.19	0.82	2.3	0.267	0.597	41.36%	51.87%
31243-101		5	3.08	0.768	5.39	1.2	5.9	0.833	1.86	60.45%	-2.67%
31243-102		5	2.78	0.668	4.89	1.3	5.6	0.761	1.7	61.17%	7.33%
31243-103		5	3.28	0.252	6.31	1.6	7.4	1.09	2.44	74.35%	-9.33%
31243-104		5	2.17	0.6	3.73	0.85	3.7	0.564	1.26	58.24%	27.80%
31243-105		5	1.24	0.525	1.95	0.64	1.9	0.256	0.572	46.31%	58.80%
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.83	1	0.0504	0.0874	9.67%	0.00%
31242-008	RS	5	0.37	0.132	0.608	0.22	0.63	0.0856	0.191	51.71%	59.04%
31243-101		5	0.772	0.129	1.41	0.22	1.4	0.231	0.517	67.03%	14.54%
31243-102		5	0.866	0.251	1.48	0.44	1.7	0.222	0.495	57.21%	4.13%
31243-103		5	1	0.213	1.79	0.58	2.1	0.283	0.634	63.36%	-10.70%
31243-104		5	0.622	0.149	1.09	0.24	1.1	0.17	0.381	61.18%	31.14%
31243-105		5	0.414	0.216	0.612	0.24	0.55	0.0713	0.159	38.52%	54.17%
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	1.8	2.9	0.328	0.569	25.09%	0.00%
31242-008	RS	5	1.03	0.314	1.75	0.58	1.8	0.258	0.577	55.97%	54.56%
31243-101		5	1.87	0.347	3.4	0.77	3.7	0.549	1.23	65.62%	17.41%
31243-102		5	1.94	0.508	3.36	0.88	3.8	0.514	1.15	59.42%	14.59%
31243-103		5	2.42	0.717	4.12	1.6	4.8	0.614	1.37	56.69%	-6.76%
31243-104		5	1.43	0.26	2.59	0.24	2.4	0.42	0.939	65.84%	37.09%
31243-105		5	0.86	0.311	1.41	0.24	1.3	0.198	0.442	51.45%	62.06%
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.328	0.0764	0.58	0.22	0.69	0.0906	0.203	61.79%	-38.59%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%

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Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.23	0.24	0.00333	0.00577	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.22	0.24	0.004	0.00894	3.82%	1.13%
31243-101		5	0.23	0.212	0.248	0.22	0.25	0.00632	0.0141	6.15%	2.82%
31243-102		5	0.234	0.217	0.251	0.22	0.25	0.006	0.0134	5.73%	1.13%
31243-103		5	0.224	0.217	0.231	0.22	0.23	0.00245	0.00548	2.45%	5.35%
31243-104		5	0.238	0.232	0.244	0.23	0.24	0.002	0.00447	1.88%	-0.56%
31243-105		5	0.234	0.227	0.241	0.23	0.24	0.00245	0.00548	2.34%	1.13%

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 008 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	1.7			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	1.7	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 018 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	5.3			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	1	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		1.7	1.3	2.1	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	3.5	0.23	0.23	
PCB 028 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 044 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 049 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.61			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	1.3	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 052 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.58			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.5	0.69	0.82	0.53	0.64	
31243-102		0.59	0.24	0.22	0.25	0.24	
31243-103		0.82	1.1	1.1	0.61	1.3	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 066 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 087 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 101 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.5	0.24	0.53			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.51	0.25	0.22	0.6	
31243-102		0.63	0.57	0.6	0.25	0.24	
31243-103		0.71	0.69	0.99	0.23	1.3	
31243-104		0.64	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 105 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.48	0.25	0.22	0.24	
31243-102		0.59	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 118 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 128 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.46	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 138 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	1.8	2.3	2.8			
31242-008	RS	1.4	0.92	0.82	1.4	0.87	
31243-101		1.2	3.3	1.4	1.9	1.9	
31243-102		3.4	1.9	1.1	1.6	1.2	
31243-103		2.4	2.1	1.9	1.4	5	
31243-104		2.5	1.5	0.61	1.1	1.8	
31243-105		0.69	0.86	1.3	1.3	1.5	
PCB 153 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	2.6	2.6	4.2			
31242-008	RS	2.1	1.4	1.3	2.1	1.6	
31243-101		1.4	5.5	1.8	3.3	3.3	
31243-102		5.8	3.2	1.7	2.5	1.9	
31243-103		3.8	2.6	2.4	2.4	7.5	
31243-104		3.7	2.5	1.1	1.7	3.2	
31243-105		1.3	1.3	2	2	2.7	
PCB 170 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.88	1	1.7			
31242-008	RS	0.76	0.22	0.24	0.54	0.24	
31243-101		0.22	2.6	0.25	0.83	1.4	
31243-102		2.3	1.1	0.22	0.86	0.24	
31243-103		1.3	0.23	0.22	0.23	3.5	
31243-104		1.5	0.72	0.24	0.76	1.4	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.
PCB 180 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	2.5	2.7	3.8			
31242-008	RS	2.3	0.82	1.2	1.8	1.1	
31243-101		1.2	5.9	1.6	3.5	3.2	
31243-102		5.6	2.8	1.3	2.6	1.6	
31243-103		3.6	2.1	1.6	1.7	7.4	
31243-104		3.7	2.2	0.98	0.85	3.1	
31243-105		0.64	0.64	1.4	1.6	1.9	
PCB 183 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.83	0.88	1			
31242-008	RS	0.63	0.22	0.24	0.52	0.24	
31243-101		0.22	1.4	0.25	1	0.99	
31243-102		1.7	0.76	0.44	0.87	0.56	
31243-103		0.96	0.76	0.6	0.58	2.1	
31243-104		1.1	0.67	0.24	0.24	0.86	
31243-105		0.24	0.24	0.55	0.51	0.53	
PCB 184 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.22	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	
PCB 187 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	2.1	1.8	2.9			
31242-008	RS	1.8	0.58	0.61	1.5	0.66	
31243-101		0.77	3.7	0.79	2.4	1.7	
31243-102		3.8	2	0.88	1.9	1.1	
31243-103		2.4	1.7	1.6	1.6	4.8	
31243-104		2.4	1.6	0.24	0.69	2.2	
31243-105		0.24	0.56	1.3	1.1	1.1	
PCB 195 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31242-008	RS	0.23	0.22	0.24	0.24	0.24	
31243-101		0.22	0.22	0.25	0.22	0.24	
31243-102		0.69	0.24	0.22	0.25	0.24	
31243-103		0.22	0.23	0.22	0.23	0.22	
31243-104		0.24	0.23	0.24	0.24	0.24	
31243-105		0.24	0.24	0.23	0.23	0.23	

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Bioaccumulation Evaluation - PCB Congeners - Nereis						EnviroSystems, Inc.
PCB 206 Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31250-PRE	PR	0.24	0.24	0.23		
31242-008	RS	0.23	0.22	0.24	0.24	0.24
31243-101		0.22	0.22	0.25	0.22	0.24
31243-102		0.22	0.24	0.22	0.25	0.24
31243-103		0.22	0.23	0.22	0.23	0.22
31243-104		0.24	0.23	0.24	0.24	0.24
31243-105		0.24	0.24	0.23	0.23	0.23
PCB 209 Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
31250-PRE	PR	0.24	0.24	0.23		
31242-008	RS	0.23	0.22	0.24	0.24	0.24
31243-101		0.22	0.22	0.25	0.22	0.24
31243-102		0.22	0.24	0.22	0.25	0.24
31243-103		0.22	0.23	0.22	0.23	0.22
31243-104		0.24	0.23	0.24	0.24	0.24
31243-105		0.24	0.24	0.23	0.23	0.23

Nereis virens
28 day Bioaccumulation Evaluation

Statistical Analysis

Evaluation of PCB Congeners in Pre-Tissue
Reference < Pre-Tissue

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Reference Tissue Significantly < Pre-Tissue?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Unequal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	1.012295	2.91999	0.2089733	0.05	FALSE	1.421108	2	C
PCB 008	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.8964213	2.01505	0.2055529	0.05	FALSE	0.01348728	5	C
PCB 018	Unequal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	1.003554	2.91999	0.210642	0.05	FALSE	4.925056	2	C
PCB 018	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.8964213	2.01505	0.2055529	0.05	FALSE	0.01348728	5	C
PCB 028	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 044	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 049	Unequal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	1.048097	2.91999	0.2022887	0.05	FALSE	0.3603209	2	C
PCB 049	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.8964213	2.01505	0.2055529	0.05	FALSE	0.01348728	5	C
PCB 052	Unequal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	1.052286	2.91999	0.2015224	0.05	FALSE	0.3311377	2	C
PCB 052	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.8964213	2.01505	0.2055529	0.05	FALSE	0.01348728	5	C
PCB 066	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 087	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	2.05436	2.91999	0.0881514	0.05	FALSE	0.2691108	2	C
PCB 101	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	27.06433	2.01505	6.4596E-07	0.05	TRUE	0.02092158	5	C
PCB 105	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 118	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 128	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 138	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	4.451915	1.94318	0.00216013	0.05	TRUE	0.5316349	6	C
PCB 153	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	3.179231	1.94318	0.00954722	0.05	TRUE	0.8760688	6	C
PCB 170	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	3.365649	1.94318	0.00756179	0.05	TRUE	0.4580364	6	C
PCB 180	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	3.364132	1.94318	0.00757599	0.05	TRUE	0.8987721	6	C
PCB 183	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	4.449024	1.94318	0.00216684	0.05	TRUE	0.2329416	6	C
PCB 184	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 187	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	2.950571	1.94318	0.01279699	0.05	TRUE	0.814441	6	C
PCB 195	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 206	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C
PCB 209	Equal Variance t Two-Sample Test	CLDS	RS	<	Pre-Tissue	PR	0.4548591	1.94318	0.3326022	0.05	FALSE	0.01139213	6	C

CETIS Analytical Report

Report Date: 22 Mar-19 13:35 (p 1 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-1392-4581		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 008	607.31%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	1.01	2.92	1.42	2	CDF	0.2090	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0374	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.455101	0.455101	1	1.92	0.2151	Non-Significant Effect					
Error	1.42139	0.236898	6								
Total	1.87649		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	8880	26.3	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.766	0.645	0.0122	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	67.80%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:35 (p 2 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	11-1731-4129	Endpoint:	PCB 008	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 13:04	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31250-PRE passed pcb 008				5.76%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.896	2.02	0.014	5	CDF	0.2056	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	5.143E-05		5.143E-05		1	0.804	0.4111	Non-Significant Effect			
Error	0.00032		0.000064		5						
Total	0.0003714				6						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Levene Equality of Variance Test			6.09	16.3	0.0567	Equal Variances				
Variances	Mod Levene Equality of Variance Test			1.09	21.2	0.3552	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.834	0.563	0.0878	Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31242-008	RS	0.23	0.22	0.24	0.24						

CETIS Analytical Report

Report Date: 22 Mar-19 13:35 (p 17 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-0851-9689		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 028	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:35 (p 23 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-7582-8798		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 044	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:36 (p 29 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-6307-8864		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 049	153.98%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	1.05	2.92	0.36	2	CDF	0.2023	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0386	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0313633	0.0313633	1	2.05	0.2017	Non-Significant Effect					
Error	0.0915867	0.0152644	6								
Total	0.12295		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	570	26.3	2.4E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.789	0.645	0.0219	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	35.60%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:36 (p 36 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0760-4360		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31250-PRE passed pcb 052			141.51%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	1.05	2.92	0.331	2	CDF	0.2015	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0388	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0267008	0.0267008	1	2.07	0.2003	Non-Significant Effect					
Error	0.0773867	0.0128978	6								
Total	0.104087		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	482	26.3	3.4E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.792	0.645	0.0234	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	33.77%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:36 (p 43 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-6770-1202		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31250-PRE passed pcb 066			4.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-9586-4993		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 087	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6773-3876		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31250-PRE passed pcb 101			115.00%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	2.05	2.92	0.269	2	CDF	0.0882	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.14	2.13	0.0432	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0672133	0.0672133	1	7.88	0.0309	Significant Effect					
Error	0.0511867	0.0085311	6								
Total	0.1184		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	318	26.3	7.8E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.828	0.645	0.0569	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	44.72%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-6608-9820		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31250-PRE failed pcb 101			8.94%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	27.1	2.02	0.021	5	CDF	6.5E-07	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.112801	0.112801	1	732	1.3E-06	Significant Effect					
Error	0.00077	0.000154	5								
Total	0.113571		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.62	31.3	0.1534	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.889	0.563	0.2700	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.515	0.324	0.706	0.515	0.5	0.53	0.015	4.12%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	54.56%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	Outlier	0.53							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-3031-7633		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 105	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-4883-1646		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 118	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-3313-7922		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 128	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0616-4546		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE failed pcb 138	49.13%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	4.45	1.94	0.532	6	CDF	0.0022	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.44	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.78161	2.78161	1	19.8	0.0043	Significant Effect					
Error	0.84208	0.140347	6								
Total	3.62369		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.92	26.3	0.3300	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.942	0.645	0.6274	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	52.96%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31242-008	RS	1.4	0.92	0.82	1.4	0.87					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7576-6898		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE failed pcb 153	51.53%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	3.18	1.94	0.876	6	CDF	0.0095	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.87	2.13	0.2453	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.85208	3.85208	1	10.1	0.0191	Significant Effect					
Error	2.28667	0.381111	6								
Total	6.13875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.89	26.3	0.1287	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.875	0.645	0.1695	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	45.74%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31242-008	RS	2.1	1.4	1.3	2.1	1.6					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-1890-1653		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE failed pcb 170	114.51%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	3.37	1.94	0.458	6	CDF	0.0076	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.7	2.13	0.4863	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.18008	1.18008	1	11.3	0.0151	Significant Effect					
Error	0.625067	0.104178	6								
Total	1.80515		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.37	26.3	0.2774	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.846	0.645	0.0868	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	66.48%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31242-008	RS	0.76	0.22	0.24	0.54	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 102 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis											EnviroSystems, Inc.
Analysis ID: 00-8924-2370		Endpoint: PCB 180			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp			Comparison Result					PMSD		
Untransformed	C < T			31250-PRE failed pcb 180					62.24%		
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	3.36	1.94	0.899	6	CDF	0.0076	Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.46	2.13	0.9901	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.53963	4.53963	1	11.3	0.0152	Significant Effect					
Error	2.40672	0.40112	6								
Total	6.94635		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.37	26.3	0.7028	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.853	0.645	0.1011	Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	51.87%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31242-008	RS	2.3	0.82	1.2	1.8	1.1					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 109 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 04-7538-5209		Endpoint: PCB 183			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31250-PRE failed pcb 183			62.96%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	4.45	1.94	0.233	6	CDF	0.0022	Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.71	2.13	0.4606		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value		Decision(α:5%)			
Between	0.533333		0.533333	1	19.8	0.0043		Significant Effect			
Error	0.161667		0.0269444	6							
Total	0.695			7							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		4.79	199	0.3599		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.889	0.645	0.2302		Normal Distribution				
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31242-008	RS	5	0.37	0.132	0.608	0.24	0.22	0.63	0.0856	51.71%	59.04%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31242-008	RS	0.63	0.22	0.24	0.52	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 116 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-9273-4658		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 184	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 122 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-0403-2376		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE failed pcb 187	79.07%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue*	2.95	1.94	0.814	6	CDF	0.0128	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.45	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.86752	2.86752	1	8.71	0.0256	Significant Effect					
Error	1.97627	0.329378	6								
Total	4.84379		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.03	199	1.0947	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.801	0.645	0.0294	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	54.56%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31242-008	RS	1.8	0.58	0.61	1.5	0.66					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 129 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-7513-9225		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 195	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:37 (p 135 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-8623-1722		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 206	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:38 (p 141 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-4647-9393		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:04		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31250-PRE passed pcb 209	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	0.455	1.94	0.011	6	CDF	0.3326	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

Nereis virens
28 day Bioaccumulation Evaluation

Statistical Analysis

Evaluation of PCB Congeners in Pre-Tissue
Reference > Pre-Tissue

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Reference Tissue Significantly > Pre-Tissue?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Unequal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-1.012295	2.91999	0.7910267	0.05	FALSE	1.421108	2	C
PCB 008	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.8964213	2.01505	0.7944471	0.05	FALSE	0.01348728	5	C
PCB 018	Unequal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-1.003554	2.91999	0.789358	0.05	FALSE	4.925056	2	C
PCB 018	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.8964213	2.01505	0.7944471	0.05	FALSE	0.01348728	5	C
PCB 028	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 044	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 049	Unequal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-1.048097	2.91999	0.7977113	0.05	FALSE	0.3603209	2	C
PCB 049	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.8964213	2.01505	0.7944471	0.05	FALSE	0.01348728	5	C
PCB 052	Unequal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-1.052286	2.91999	0.7984776	0.05	FALSE	0.3311377	2	C
PCB 052	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.8964213	2.01505	0.7944471	0.05	FALSE	0.01348728	5	C
PCB 066	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 087	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 101	Unequal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-2.05436	2.91999	0.9118486	0.05	FALSE	0.2691108	2	C
PCB 101	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-27.06433	2.01505	0.9999993	0.05	FALSE	0.02092158	5	C
PCB 105	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 118	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 128	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 138	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-4.451915	1.94318	0.9978399	0.05	FALSE	0.5316349	6	C
PCB 153	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-3.179231	1.94318	0.9904528	0.05	FALSE	0.8760688	6	C
PCB 170	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-3.365649	1.94318	0.9924382	0.05	FALSE	0.4580364	6	C
PCB 180	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-3.364132	1.94318	0.992424	0.05	FALSE	0.8987721	6	C
PCB 183	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-4.449024	1.94318	0.9978331	0.05	FALSE	0.2329416	6	C
PCB 184	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 187	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-2.950571	1.94318	0.987203	0.05	FALSE	0.814441	6	C
PCB 195	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 206	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C
PCB 209	Equal Variance t Two-Sample Test	CLDS	RS	>	Pre-tissue	PR	-0.4548591	1.94318	0.6673978	0.05	FALSE	0.01139213	6	C

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 12-2272-2322		Endpoint: PCB 008			CETIS Version: CETISv1.9.3						
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C > T		31250-PRE passed pcb 008				607.31%				
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-1.01	2.92	1.42	2	CDF	0.7910	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			2.16	2.13	0.0374	Outlier Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.455101	0.455101	1	1.92	0.2151	Non-Significant Effect					
Error	1.42139	0.236898	6								
Total	1.87649		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			8880	26.3	<1.0E-37	Unequal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.766	0.645	0.0122	Normal Distribution				
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	67.80%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-6463-1400		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 008			5.76%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.896	2.02	0.014	5	CDF	0.7944	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.804	0.4111	Non-Significant Effect					
Error	0.00032	0.000064	5								
Total	0.0003714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	6.09	16.3	0.0567	Equal Variances						
Variances	Mod Levene Equality of Variance Test	1.09	21.2	0.3552	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.563	0.0878	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31242-008	RS	0.23	0.22	0.24	0.24						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-6294-5151		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 018	2104.72%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-1	2.92	4.93	2	CDF	0.7894	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0373	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.3721	5.3721	1	1.89	0.2185	Non-Significant Effect					
Error	17.0694	2.8449	6								
Total	22.4415		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	107000	26.3	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.76	0.645	0.0105	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	87.85%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-6877-6721		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 028			4.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-4011-7580		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 044	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-2506-6576		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 049	153.98%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-1.05	2.92	0.36	2	CDF	0.7977	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0386	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0313633	0.0313633	1	2.05	0.2017	Non-Significant Effect					
Error	0.0915867	0.0152644	6								
Total	0.12295		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	570	26.3	2.4E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.789	0.645	0.0219	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	35.60%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-4833-7926		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 049			5.76%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.896	2.02	0.014	5	CDF	0.7944	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.804	0.4111	Non-Significant Effect					
Error	0.00032	0.000064	5								
Total	0.0003714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	6.09	16.3	0.0567	Equal Variances						
Variances	Mod Levene Equality of Variance Test	1.09	21.2	0.3552	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.563	0.0878	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	2.50%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31242-008	RS	0.23	0.22	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-5476-6910		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 052	141.51%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-1.05	2.92	0.331	2	CDF	0.7985	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0388	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0267008	0.0267008	1	2.07	0.2003	Non-Significant Effect					
Error	0.0773867	0.0128978	6								
Total	0.104087		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	482	26.3	3.4E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.792	0.645	0.0234	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	33.77%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-4043-1727		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 052			5.76%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.896	2.02	0.014	5	CDF	0.7944	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.804	0.4111	Non-Significant Effect					
Error	0.00032	0.000064	5								
Total	0.0003714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	6.09	16.3	0.0567	Equal Variances						
Variances	Mod Levene Equality of Variance Test	1.09	21.2	0.3552	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.563	0.0878	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	2.50%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31242-008	RS	0.23	0.22	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-3533-1568		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31250-PRE passed pcb 066				4.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-1559-8824		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 087	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 18-9346-3996		Endpoint: PCB 101		CETIS Version: CETISv1.9.3								
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL								
Data Transform	Alt Hyp		Comparison Result			PMSD						
Untransformed	C > T		31250-PRE passed pcb 101			8.94%						
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		Pre-Test Tissue	-27.1	2.02	0.021	5	CDF	1.0000	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.112801		0.112801	1	732	1.3E-06	Significant Effect					
Error	0.00077		0.000154	5								
Total	0.113571			6								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			5.62	31.3	0.1534	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.889	0.563	0.2700	Normal Distribution					
PCB 101 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	2	0.515	0.324	0.706	0.515	0.5	0.53	0.015	4.12%	0.00%	
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	54.56%	
PCB 101 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	0.5	Outlier	0.53								
31242-008	RS	0.23	0.22	0.24	0.24	0.24						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-3767-0684		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 105			4.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2733-3052		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31250-PRE passed pcb 118			4.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.88	2.13	0.2261	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.4	199	0.6302	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.825	0.645	0.0524	Normal Distribution					
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-2357-8811		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31250-PRE passed pcb 128			4.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-7594-5544		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31250-PRE passed pcb 138				49.13%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-4.45	1.94	0.532	6	CDF	0.9978	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.44	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.78161	2.78161	1	19.8	0.0043	Significant Effect					
Error	0.84208	0.140347	6								
Total	3.62369		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.92	26.3	0.3300	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.942	0.645	0.6274	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31242-008	RS	5	1.08	0.719	1.45	0.92	0.82	1.4	0.131	27.03%	52.96%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31242-008	RS	1.4	0.92	0.82	1.4	0.87					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-2651-2170		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 153	51.53%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-3.18	1.94	0.876	6	CDF	0.9905	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.87	2.13	0.2453	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.85208	3.85208	1	10.1	0.0191	Significant Effect					
Error	2.28667	0.381111	6								
Total	6.13875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.89	26.3	0.1287	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.875	0.645	0.1695	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31242-008	RS	5	1.7	1.23	2.17	1.6	1.3	2.1	0.17	22.40%	45.74%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31242-008	RS	2.1	1.4	1.3	2.1	1.6					

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 Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-3009-6749		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31242-008	Reference sediment	New Haven Harbor 2018		CLDS Reference (NHH-CL							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31250-PRE passed pcb 170			114.51%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-3.37	1.94	0.458	6	CDF	0.9924	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.7	2.13	0.4863	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.18008	1.18008	1	11.3	0.0151	Significant Effect					
Error	0.625067	0.104178	6								
Total	1.80515		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			3.37	26.3	0.2774	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.846	0.645	0.0868	Normal Distribution				
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31242-008	RS	5	0.4	0.1	0.7	0.24	0.22	0.76	0.108	60.31%	66.48%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31242-008	RS	0.76	0.22	0.24	0.54	0.24					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 19 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-6061-6757		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 180	62.24%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-3.36	1.94	0.899	6	CDF	0.9924	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.46	2.13	0.9901	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.53963	4.53963	1	11.3	0.0152	Significant Effect					
Error	2.40672	0.40112	6								
Total	6.94635		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.37	26.3	0.7028	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.853	0.645	0.1011	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31242-008	RS	5	1.44	0.702	2.19	1.2	0.82	2.3	0.267	41.36%	51.87%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31242-008	RS	2.3	0.82	1.2	1.8	1.1					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 20 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 13-7792-2768		Endpoint: PCB 183		CETIS Version: CETISv1.9.3								
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018									
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C > T	31250-PRE passed pcb 183	62.96%									
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Reference Sed		Pre-Test Tissue	-4.45	1.94	0.233	6	CDF	0.9978	Non-Significant Effect			
Auxiliary Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	1.71	2.13	0.4606	No Outliers Detected							
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.533333	0.533333	1	19.8	0.0043	Significant Effect						
Error	0.161667	0.0269444	6									
Total	0.695		7									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	4.79	199	0.3599	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.889	0.645	0.2302	Normal Distribution							
PCB 183 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%	
31242-008	RS	5	0.37	0.132	0.608	0.24	0.22	0.63	0.0856	51.71%	59.04%	
PCB 183 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	0.83	0.88	1								
31242-008	RS	0.63	0.22	0.24	0.52	0.24						

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 21 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-7316-3279		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 184	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 22 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8246-2816		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 187	79.07%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-2.95	1.94	0.814	6	CDF	0.9872	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.45	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.86752	2.86752	1	8.71	0.0256	Significant Effect					
Error	1.97627	0.329378	6								
Total	4.84379		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.03	199	1.0947	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.801	0.645	0.0294	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31242-008	RS	5	1.03	0.314	1.75	0.66	0.58	1.8	0.258	55.97%	54.56%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31242-008	RS	1.8	0.58	0.61	1.5	0.66					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 23 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-3081-6491		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 195	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 24 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-3184-1824		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 206	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 04 Apr-19 11:35 (p 25 of 25)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-3902-9504		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 04 Apr-19 11:28		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31242-008	14-2067-5029	23 Oct-18 10:28	24 Oct-18 10:15	28d 2h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31242-008	Reference sediment	New Haven Harbor 2018	CLDS Reference (NHH-CL								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31250-PRE passed pcb 209	4.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Reference Sed		Pre-Test Tissue	-0.455	1.94	0.011	6	CDF	0.6674	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.88	2.13	0.2261	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.207	0.6652	Non-Significant Effect					
Error	0.0003867	6.444E-05	6								
Total	0.0004		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.4	199	0.6302	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.825	0.645	0.0524	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31242-008	RS	5	0.234	0.223	0.245	0.24	0.22	0.24	0.004	3.82%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31242-008	RS	0.23	0.22	0.24	0.24	0.24					

Nereis virens
28 day Bioaccumulation Evaluation

Statistical Analysis

Evaluation of PCB Congeners in Pre-Tissue
Pre-Tissue < Treatment

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly < Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-1.020462	2.91999	0.7925729	0.05	FALSE	1.42118	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.9449109	2.01505	0.805954	0.05	FALSE	0.02132527	5		C
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.909674	2.91999	0.7704917	0.05	FALSE	4.945425	2		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 2	20		0.5714286	0.05	FALSE		5	2	E
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-1.079662	2.91999	0.8034067	0.05	FALSE	0.3606048	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.9449109	2.01505	0.805954	0.05	FALSE	0.02132527	5		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	2.502038	1.94318	0.02320008	0.05	TRUE	0.21953	6		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.4975708	1.94318	0.6817535	0.05	FALSE	0.2473378	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 2	22		0.4464286	0.05	FALSE		6	2	E
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.4479309	2.01505	0.6635278	0.05	FALSE	0.01874404	5		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 128	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 2	22		0.4464286	0.05	FALSE		6	2	E
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.4479309	2.01505	0.6635278	0.05	FALSE	0.01874404	5		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.6758453	1.94318	0.7378407	0.05	FALSE	1.035066	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.0706561	1.94318	0.5270162	0.05	FALSE	2.016807	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.2158146	1.94318	0.581859	0.05	FALSE	1.200525	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	0.06963579	1.94318	0.4733732	0.05	FALSE	2.232394	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.4226365	1.94318	0.656356	0.05	FALSE	0.6038389	6		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.5121081	1.94318	0.6865635	0.05	FALSE	1.497552	6		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 2	-0.7595546	1.94318	0.7618532	0.05	FALSE	0.01705544	6		C
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-1.012252	2.91999	0.7910186	0.05	FALSE	1.421168	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.597614	2.01505	0.7119341	0.05	FALSE	0.02023092	5		C
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-1.003551	2.91999	0.7893573	0.05	FALSE	4.925074	2		C
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.597614	2.01505	0.7119341	0.05	FALSE	0.02023092	5		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly < Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-1.04741	2.91999	0.7975852	0.05	FALSE	0.3605575	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.597614	2.01505	0.7119341	0.05	FALSE	0.02023092	5		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 3	23		0.625	0.05	FALSE		6	1	E
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	0.2574721	1.94318	0.4027085	0.05	FALSE	0.2616346	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 3	20		0.3214286	0.05	FALSE		6	2	E
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	0.1048284	2.01505	0.4602937	0.05	FALSE	0.01601861	5		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.776114	1.94318	0.7664185	0.05	FALSE	1.151716	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.106522	1.94318	0.5406798	0.05	FALSE	2.067429	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.4616098	1.94318	0.6696885	0.05	FALSE	1.049587	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.2083108	1.94318	0.5790612	0.05	FALSE	2.052221	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.1253963	1.94318	0.547847	0.05	FALSE	0.5785289	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-2.013729	2.01505	0.9499158	0.05	FALSE	0.2459944	5		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.4550425	1.94318	0.6674601	0.05	FALSE	1.412055	6		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 3	20		0.3214286	0.05	FALSE		6	2	E
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	0.1048284	2.01505	0.4602937	0.05	FALSE	0.01601861	5		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 3	-0.3188965	1.94318	0.6196927	0.05	FALSE	0.01624921	6		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 4	27.5		0.9642857	0.05	FALSE		6	1	E
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-0.6125021	1.94318	0.7186579	0.05	FALSE	2.590899	6		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 049	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 4	27		0.9107143	0.05	FALSE		6	0	E
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-1.121314	2.91999	0.8106458	0.05	FALSE	0.3602302	2		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	3.485831	1.94318	0.00652472	0.05	TRUE	0.3526807	6		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly < Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	1.466144	1.94318	0.09648371	0.05	FALSE	0.4780159	6		C
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	0.2996103	1.94318	0.3872912	0.05	FALSE	1.68628	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-1.009662	2.01505	0.8205035	0.05	FALSE	0.6985179	5		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	0.4468236	1.94318	0.3353392	0.05	FALSE	2.638319	6		C
PCB 153	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 4	19		0.9142857	0.05	FALSE		5	1	E
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-0.1121063	1.94318	0.5428022	0.05	FALSE	1.687115	6		C
PCB 170	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 4	20		0.9428571	0.05	FALSE		5	0	E
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	0.1887074	1.94318	0.4282717	0.05	FALSE	2.88325	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-1.165397	2.01505	0.8517871	0.05	FALSE	1.2968	5		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	0.2546709	1.94318	0.4037406	0.05	FALSE	0.7375823	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-1.58603	2.01505	0.9132045	0.05	FALSE	0.2265723	5		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	0.179878	1.94318	0.4315848	0.05	FALSE	1.656425	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-1.236173	2.01505	0.864352	0.05	FALSE	0.7199473	5		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 4	-3.109604	1.94318	0.9895703	0.05	FALSE	0.00791535	6		C
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.004101	2.91999	0.7894628	0.05	FALSE	1.421072	2		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21		1	0.05	FALSE		5	2	E
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.001185	2.91999	0.7889031	0.05	FALSE	4.925046	2		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21		1	0.05	FALSE		5	2	E
PCB 028	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 044	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.016083	2.91999	0.7917454	0.05	FALSE	0.3601789	2		C
PCB 049	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21		1	0.05	FALSE		5	2	E
PCB 052	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.017489	2.91999	0.7920115	0.05	FALSE	0.3309832	2		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21		1	0.05	FALSE		5	2	E
PCB 066	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 087	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly < Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-0.8314714	1.94318	0.7812305	0.05	FALSE	0.246168	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 118	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 128	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.678744	1.94318	0.927896	0.05	FALSE	0.923701	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-0.9325446	1.94318	0.8064784	0.05	FALSE	1.444726	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-0.7408203	1.94318	0.7566141	0.05	FALSE	0.7064645	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.03215	1.94318	0.8291003	0.05	FALSE	1.570132	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.223783	1.94318	0.8665465	0.05	FALSE	0.4467143	6		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 5	-1.38031	1.94318	0.891643	0.05	FALSE	1.183478	6		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 206	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 209	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	<	Comp 5	21.5		0.6428571	0.05	FALSE		6	3	E
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.012316	2.91999	0.7910308	0.05	FALSE	1.421078	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.46385	2.01505	0.8984447	0.05	FALSE	0.00825923	5		C
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6885809	1.94318	0.7415935	0.05	FALSE	2.931125	6		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.048442	2.91999	0.7977744	0.05	FALSE	0.3602026	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.46385	2.01505	0.8984447	0.05	FALSE	0.00825923	5		C
PCB 052	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.052695	2.91999	0.7985523	0.05	FALSE	0.331009	2		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-1.46385	2.01505	0.8984447	0.05	FALSE	0.00825923	5		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 101	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-2.055571	2.91999	0.9119266	0.05	FALSE	0.2689523	2		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-31.45613	2.01505	0.9999997	0.05	FALSE	0.01800058	5		C
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-4.00272	1.94318	0.9964515	0.05	FALSE	0.5679939	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-2.434092	1.94318	0.9745607	0.05	FALSE	1.016525	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly < Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 170	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-3.751755	2.91999	0.9678644	0.05	FALSE	0.7466477	2		C
PCB 170	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-11.75687	6.31375	0.9729906	0.05	FALSE	0.3791407	1		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-3.909209	1.94318	0.9960502	0.05	FALSE	0.876845	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-4.798582	1.94318	0.9984974	0.05	FALSE	0.198155	6		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-3.94566	1.94318	0.9962124	0.05	FALSE	0.6927629	6		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	<	Comp 6	-0.6546537	1.94318	0.7315183	0.05	FALSE	0.00791534	6		C

CETIS Analytical Report

Report Date: 22 Mar-19 13:35 (p 3 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-6502-5890		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 008				195.58%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-1.02	2.92	1.42	2	CDF	0.7926	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0375	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.462521	0.462521	1	1.95	0.2119	Non-Significant Effect					
Error	1.42187	0.236978	6								
Total	1.88439		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3550	26.3	6.3E-07	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.771	0.645	0.0140	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	68.35%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-8597-1190		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 008				8.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.598	2.02	0.020	5	CDF	0.7119	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-3621-9758		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 008				141.76%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	27.5	n/a	1	6	Exact	0.9643	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.76	2.13	0.3899	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0800833	0.0800833	1	0.152	0.7101	Non-Significant Effect					
Error	3.16167	0.526944	6								
Total	3.24175		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.63	26.3	0.6062	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.686	0.645	0.0016	Non-Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31243-103		5	0.52	-0.299	1.34	0.23	0.22	1.7	0.295	126.86%	28.44%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31243-103		0.22	0.23	1.7	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-1819-6195		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 008	2.81%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21	n/a	2	5	Exact	1.0000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	2.54	16.3	0.1719	Equal Variances						
Variances	Mod Levene Equality of Variance Test	0.444	21.2	0.5415	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.634	0.563	6.7E-04	Non-Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-6574-6891		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 008			3.44%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-1.46	2.02	0.008	5	CDF	0.8984	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	2.14	0.2031	Non-Significant Effect					
Error	0.00012	0.000024	5								
Total	0.0001714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	34.3	16.3	0.0021	Unequal Variances						
Variances	Mod Levene Equality of Variance Test	1.33	21.2	0.3125	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.805	0.563	0.0454	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-105		0.24	0.24	0.23	0.23						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-7298-9691		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 018			256.68%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.91	2.92	4.95	2	CDF	0.7705	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.13	2.13	0.0482	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.4506	4.4506	1	1.52	0.2634	Non-Significant Effect					
Error	17.541	2.9235	6								
Total	21.9916		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	72.3	26.3	0.0014	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.821	0.645	0.0482	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-101		5	0.386	-0.0405	0.812	0.24	0.22	1	0.154	88.99%	79.97%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-101		0.22	1	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-3945-9699		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 018				215.81%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	20	n/a	2	5	Exact	0.5714	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0304514	0.0304514	1	0.323	0.5946	Non-Significant Effect					
Error	0.47192	0.094384	5								
Total	0.502371		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	2.53	16.3	0.1726	Equal Variances						
Variances	Mod Levene Equality of Variance Test	0.528	21.2	0.5078	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.657	0.563	0.0012	Non-Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-101		5	0.386	-0.0405	0.812	0.24	0.22	1	0.154	88.99%	-60.83%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-101		0.22	1	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-0505-3529		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 018				8.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.598	2.02	0.020	5	CDF	0.7119	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-9230-6681		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 018				134.48%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-0.613	1.94	2.59	6	CDF	0.7187	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.13	0.1249	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.25052	1.25052	1	0.375	0.5627	Non-Significant Effect					
Error	19.9999	3.33331	6								
Total	21.2504		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	11.6	26.3	0.0429	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.894	0.645	0.2534	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-103		5	1.11	0.0472	2.17	1.3	0.22	2.1	0.383	77.12%	42.39%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-103		1.7	1.3	2.1	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-7100-4239		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 018	255.63%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-1	2.92	4.93	2	CDF	0.7889	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0373	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.34674	5.34674	1	1.88	0.2195	Non-Significant Effect					
Error	17.0691	2.84486	6								
Total	22.4159		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	427000	26.3	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.758	0.645	0.0101	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	87.65%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Report Date: 22 Mar-19 13:35 (p 15 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-4088-3503		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 018	2.81%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21	n/a	2	5	Exact	1.0000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	2.54	16.3	0.1719	Equal Variances						
Variances	Mod Levene Equality of Variance Test	0.444	21.2	0.5415	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.634	0.563	6.7E-04	Non-Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-9481-2471		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 018	152.13%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.689	1.94	2.93	6	CDF	0.7416	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.76	2.13	0.3777	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.0228	2.0228	1	0.474	0.5168	Non-Significant Effect					
Error	25.5973	4.26622	6								
Total	27.6202		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	26.3	0.2220	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.764	0.645	0.0118	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-105		5	0.888	-0.925	2.7	0.24	0.23	3.5	0.653	164.43%	53.91%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-105		0.24	0.24	3.5	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-6535-1711		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 028				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Report Date: 22 Mar-19 13:35 (p 19 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-3618-4710		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed pcb 028			6.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-2465-2932		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 028	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-9515-5571		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 028			2.96%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.75	2.13	0.4021	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.67	26.3	0.5950	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.685	0.645	0.0015	Non-Normal Distribution					
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Report Date: 22 Mar-19 13:35 (p 22 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-1953-9604		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 028			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Report Date: 22 Mar-19 13:35 (p 24 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-7695-8104		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 044				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Report Date: 22 Mar-19 13:36 (p 25 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-9205-0687		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 044				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-1873-2135		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 044	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-7002-6104		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 044				2.96%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-4903-3854		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-105 passed pcb 044				3.34%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.29	2.13	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.11	26.3	0.8265	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.84	0.645	0.0762	Normal Distribution				
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-0331-6155		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 049				99.25%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-1.08	2.92	0.361	2	CDF	0.8034	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.15	2.13	0.0406	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0333333	0.0333333	1	2.17	0.1909	Non-Significant Effect					
Error	0.0920667	0.0153444	6								
Total	0.1254		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	228	26.3	1.5E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.808	0.645	0.0347	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	36.70%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-7671-6749		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 049				99.24%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-1.05	2.92	0.361	2	CDF	0.7976	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.15	2.13	0.0403	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0313633	0.0313633	1	2.05	0.2026	Non-Significant Effect					
Error	0.0919867	0.0153311	6								
Total	0.12335		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	254	26.3	1.2E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.808	0.645	0.0346	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	35.60%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7640-7424		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 049				8.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.598	2.02	0.020	5	CDF	0.7119	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-1712-6071		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 049				99.15%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.12	2.92	0.36	2	CDF	0.8106	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0328048	0.0328048	1	1.8	0.2380	Non-Significant Effect					
Error	0.0913667	0.0182733	5								
Total	0.124171		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1370	49.8	7.2E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.803	0.563	0.0438	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-103		4	0.225	0.216	0.234	0.225	0.22	0.23	0.00289	2.57%	38.07%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-103		0.22	0.23	Outlier	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	21-2185-8339		Endpoint:	PCB 049		CETIS Version:	CETISv1.9.3				
Analyzed:	22 Mar-19 13:15		Analysis:	Nonparametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 049			2.81%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21	n/a	2	5	Exact	1.0000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Levene Equality of Variance Test		2.54	16.3	0.1719	Equal Variances					
Variances	Mod Levene Equality of Variance Test		0.444	21.2	0.5415	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.634	0.563	6.7E-04	Non-Normal Distribution					
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-1578-4729		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 049				3.44%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-1.46	2.02	0.008	5	CDF	0.8984	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	2.14	0.2031	Non-Significant Effect					
Error	0.00012	0.000024	5								
Total	0.0001714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	34.3	16.3	0.0021	Unequal Variances						
Variances	Mod Levene Equality of Variance Test	1.33	21.2	0.3125	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.805	0.563	0.0454	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	2.50%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-105		0.24	0.24	0.23	0.23						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-2037-4713		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 failed pcb 052	62.13%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101*	2.5	1.94	0.22	6	CDF	0.0232	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.58	2.13	0.7020	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.149813	0.149813	1	6.26	0.0464	Significant Effect					
Error	0.143587	0.0239311	6								
Total	0.2934		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.32	26.3	0.4292	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.848	0.645	0.0915	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-101		5	0.636	0.476	0.796	0.64	0.5	0.82	0.0577	20.28%	-80.00%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-101		0.5	0.69	0.82	0.53	0.64					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-0527-1558		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 052				68.97%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	23	n/a	1	6	Exact	0.6250	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.77	2.13	0.3637	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0038533	0.0038533	1	0.131	0.7301	Non-Significant Effect					
Error	0.176947	0.0294911	6								
Total	0.1808		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	26.3	0.6372	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.7	0.645	0.0023	Non-Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	12.83%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-102		0.59	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-9297-7348		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 failed pcb 052	99.82%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.49	1.94	0.353	6	CDF	0.0065	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.63	2.13	0.5978	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.750501	0.750501	1	12.2	0.0130	Significant Effect					
Error	0.370587	0.0617644	6								
Total	1.12109		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.9	199	0.7453	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.953	0.645	0.7434	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-103		5	0.986	0.65	1.32	1.1	0.61	1.3	0.121	27.47%	-179.06%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-103		0.82	1.1	1.1	0.61	1.3					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-1160-7720		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 052	2.81%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21	n/a	2	5	Exact	1.0000	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	2.54	16.3	0.1719	Equal Variances						
Variances	Mod Levene Equality of Variance Test	0.444	21.2	0.5415	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.634	0.563	6.7E-04	Non-Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-1214-0960		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 052			93.68%						
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-1.05	2.92	0.331	2	CDF	0.7986	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0379	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0267008	0.0267008	1	2.08	0.1998	Non-Significant Effect					
Error	0.0771867	0.0128644	6								
Total	0.103887		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1280	26.3	4.8E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.779	0.645	0.0170	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	33.77%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-6470-2914		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-105 passed pcb 052				3.44%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-1.46	2.02	0.008	5	CDF	0.8984	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	2.14	0.2031	Non-Significant Effect					
Error	0.00012	0.000024	5								
Total	0.0001714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	34.3	16.3	0.0021	Unequal Variances						
Variances	Mod Levene Equality of Variance Test	1.33	21.2	0.3125	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.805	0.563	0.0454	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	2.50%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-105		0.24	0.24	0.23	0.23						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7170-0415		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 066			7.21%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-1312-6889		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 066	6.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-9176-3271		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 066	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-3308-5023		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed pcb 066			2.96%						
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-3170-0822		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 066	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-9175-4320		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 087				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-3794-1071		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed pcb 087			6.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6949-1907		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 087	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-8935-4439	Endpoint:	PCB 087	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 13:15	Analysis:	Nonparametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed pcb 087				2.96%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.75	2.13	0.4021	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	26.3	0.5950	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.685	0.645	0.0015	Non-Normal Distribution				
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7727-3257		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 087			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-3648-6600		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 101	58.43%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.498	1.94	0.247	6	CDF	0.6818	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.49	2.13	0.9208	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0075208	0.0075208	1	0.248	0.6365	Non-Significant Effect					
Error	0.182267	0.0303778	6								
Total	0.189787		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.29	199	0.9605	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.885	0.645	0.2097	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-101		5	0.36	0.135	0.585	0.25	0.22	0.6	0.0811	50.35%	14.96%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-101		0.22	0.51	0.25	0.22	0.6					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-2295-8550		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 101	61.80%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.257	1.94	0.262	6	CDF	0.4027	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.28	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0022533	0.0022533	1	0.0663	0.8054	Non-Significant Effect					
Error	0.203947	0.0339911	6								
Total	0.2062		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.5	199	0.8732	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.785	0.645	0.0197	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-102		5	0.458	0.215	0.701	0.57	0.24	0.63	0.0875	42.71%	-8.19%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-102		0.63	0.57	0.6	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-0092-2394		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 101	112.92%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	1.47	1.94	0.478	6	CDF	0.0965	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.78	2.13	0.3597	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.243901	0.243901	1	2.15	0.1930	Non-Significant Effect					
Error	0.680787	0.113464	6								
Total	0.924687		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6.19	199	0.2877	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.974	0.645	0.9259	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-103		5	0.784	0.291	1.28	0.71	0.23	1.3	0.177	50.62%	-85.20%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-103		0.71	0.69	0.99	0.23	1.3					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-1543-2493		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-104 passed pcb 101			58.15%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-0.831	1.94	0.246	6	CDF	0.7812	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.13	0.1181	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0208033	0.0208033	1	0.691	0.4375	Non-Significant Effect					
Error	0.180547	0.0300911	6								
Total	0.20135		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.27	199	0.9682	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.862	0.645	0.1246	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-104		5	0.318	0.0944	0.542	0.24	0.23	0.64	0.0805	56.62%	24.88%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-104		0.64	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-5490-5118		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-105 passed pcb 101			63.53%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-2.06	2.92	0.269	2	CDF	0.9119	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.15	2.13	0.0416	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0672133	0.0672133	1	7.91	0.0307	Significant Effect					
Error	0.0509867	0.0084978	6								
Total	0.1182		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		848	26.3	1.1E-05	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.811	0.645	0.0371	Normal Distribution					
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	44.72%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-0947-0538		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 105				54.60%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	22	n/a	2	6	Exact	0.4464	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.35	2.13	0.0025	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0038533	0.0038533	1	0.465	0.5208	Non-Significant Effect					
Error	0.0497467	0.0082911	6								
Total	0.0536		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	373	199	0.0054	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.706	0.645	0.0026	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.282	0.144	0.42	0.24	0.22	0.48	0.0498	39.52%	-19.15%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.48	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-0712-0798		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 105			7.92%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.448	2.02	0.019	5	CDF	0.6635	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.976E-05	2.976E-05	1	0.201	0.6729	Non-Significant Effect					
Error	0.0007417	0.0001483	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6.75	199	0.2635	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.923	0.563	0.4935	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	1.76%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	Outlier	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-3321-5252		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 105	77.39%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	20	n/a	2	6	Exact	0.3214	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.36	2.13	0.0019	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0095408	0.0095408	1	0.573	0.4778	Non-Significant Effect					
Error	0.0999467	0.0166578	6								
Total	0.109487		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	749	199	0.0027	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.686	0.645	0.0016	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	-30.14%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.59	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-8181-1156		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 105				6.77%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.105	2.02	0.016	5	CDF	0.4603	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.190E-06	1.190E-06	1	0.011	0.9206	Non-Significant Effect					
Error	0.0005417	0.0001083	5								
Total	0.0005429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.75	199	0.3576	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.881	0.563	0.2294	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		4	0.237	0.217	0.258	0.24	0.22	0.25	0.00629	5.30%	-0.35%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		Outlier	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-3776-3551		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 passed pcb 105			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-4601-8788		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 105	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-3069-6391		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 105	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-7109-1936		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 118			7.21%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-9313-1393		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed pcb 118			6.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-0217-3648		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 118	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	14-3729-9492	Endpoint:	PCB 118	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 13:15	Analysis:	Nonparametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed pcb 118				2.96%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.75	2.13	0.4021	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	26.3	0.5950	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.685	0.645	0.0015	Non-Normal Distribution				
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-0246-5856		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 118	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 16-4252-2609		Endpoint: PCB 128			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:13		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-101 passed pcb 128				50.26%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	22	n/a	2	6	Exact	0.4464	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.35	2.13	0.0027	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0032033	0.0032033	1	0.456	0.5246	Non-Significant Effect					
Error	0.0421467	0.0070245	6								
Total	0.04535		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		316	199	0.0063	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.711	0.645	0.0030	Non-Normal Distribution					
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.278	0.151	0.405	0.24	0.22	0.46	0.0459	36.89%	-17.46%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.46	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-4415-7155		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 128			7.92%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.448	2.02	0.019	5	CDF	0.6635	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.976E-05	2.976E-05	1	0.201	0.6729	Non-Significant Effect					
Error	0.0007417	0.0001483	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6.75	199	0.2635	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.923	0.563	0.4935	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	1.76%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	Outlier	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-5336-3698		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 128	6.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-6953-1812		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 128	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-5580-8036		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 128				2.96%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-9700-4941		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 128			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-2830-2611		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 138	45.00%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.676	1.94	1.04	6	CDF	0.7378	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.01	2.13	0.1118	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.243	0.243	1	0.457	0.5243	Non-Significant Effect					
Error	3.192	0.532	6								
Total	3.435		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.69	199	0.5775	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.645	0.2429	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-101		5	1.94	0.921	2.96	1.9	1.2	3.3	0.367	42.29%	15.65%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-101		1.2	3.3	1.4	1.9	1.9					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-0750-3037		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 138				50.07%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.776	1.94	1.15	6	CDF	0.7664	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.08	2.13	0.0738	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.39675	0.39675	1	0.602	0.4672	Non-Significant Effect					
Error	3.952	0.658667	6								
Total	4.34875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.45	199	0.4741	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.879	0.645	0.1843	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-102		5	1.84	0.687	2.99	1.6	1.1	3.4	0.415	50.49%	20.00%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-102		3.4	1.9	1.1	1.6	1.2					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-2535-7460		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 138	73.32%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	0.3	1.94	1.69	6	CDF	0.3873	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.22	2.13	0.0207	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.12675	0.12675	1	0.0898	0.7746	Non-Significant Effect					
Error	8.472	1.412	6								
Total	8.59875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	7.97	199	0.2291	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.829	0.645	0.0575	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-103		5	2.56	0.807	4.31	2.1	1.4	5	0.631	55.15%	-11.30%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-103		2.4	2.1	1.9	1.4	5					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-4840-5897		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 138	30.37%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.01	2.02	0.699	5	CDF	0.8205	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.21	0.21	1	1.02	0.3590	Non-Significant Effect					
Error	1.03	0.206	5								
Total	1.24		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.42	49.8	0.7382	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.914	0.563	0.4255	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-103		4	1.95	1.28	2.62	2	1.4	2.4	0.21	21.55%	15.22%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-103		2.4	2.1	1.9	1.4	Outlier					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-2838-0565		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-104 passed pcb 138			40.16%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-1.68	1.94	0.924	6	CDF	0.9279	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.66	2.13	0.5564	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.19401	1.19401	1	2.82	0.1442	Non-Significant Effect					
Error	2.54208	0.42368	6								
Total	3.73609		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		2.04	199	0.7094	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.985	0.645	0.9840	Normal Distribution					
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-104		5	1.5	0.615	2.39	1.5	0.61	2.5	0.32	47.57%	34.70%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-104		2.5	1.5	0.61	1.1	1.8					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	19-2921-8550	Endpoint:	PCB 138	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 13:15	Analysis:	Parametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed pcb 138				24.70%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-4	1.94	0.568	6	CDF	0.9965	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.35	2.13	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.56669	2.56669	1	16	0.0071	Significant Effect					
Error	0.9612	0.1602	6								
Total	3.52789		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			2.17	26.3	0.4604	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.935	0.645	0.5609	Normal Distribution				
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-105		5	1.13	0.708	1.55	1.3	0.69	1.5	0.152	30.05%	50.87%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-105		0.69	0.86	1.3	1.3	1.5					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-9570-4308		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 153	64.37%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.0707	1.94	2.02	6	CDF	0.5270	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.85	2.13	0.2588	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0100833	0.0100833	1	0.00499	0.9460	Non-Significant Effect					
Error	12.1187	2.01978	6								
Total	12.1287		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.05	199	0.5237	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.952	0.645	0.7267	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-101		5	3.06	1.06	5.06	3.3	1.4	5.5	0.722	52.72%	2.34%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-101		1.4	5.5	1.8	3.3	3.3					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-0518-2513		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed pcb 153			65.98%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.107	1.94	2.07	6	CDF	0.5407	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.06	2.13	0.0821	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0240833	0.0240833	1	0.0113	0.9186	Non-Significant Effect					
Error	12.7347	2.12244	6								
Total	12.7588		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.23	199	0.5001	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.854	0.645	0.1049	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-102		5	3.02	0.958	5.08	2.5	1.7	5.8	0.743	54.98%	3.62%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-102		5.8	3.2	1.7	2.5	1.9					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 09-8567-7399		Endpoint: PCB 153		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 13:14		Analysis: Nonparametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018									
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C < T	31243-103 passed pcb 153	38.47%									
Wilcoxon Rank Sum Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)			
Pre-Test Tissue		31243-103	19	n/a	1	5	Exact	0.9143	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.190476	0.190476	1	0.311	0.6014	Non-Significant Effect						
Error	3.06667	0.613333	5									
Total	3.25714		6									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	1.88	49.8	0.5907	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.724	0.563	0.0067	Non-Normal Distribution							
PCB 153 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%	
31243-103		4	2.8	1.73	3.87	2.5	2.4	3.8	0.337	24.05%	10.64%	
PCB 153 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	2.6	2.6	4.2								
31243-103		3.8	2.6	2.4	2.4	Outlier						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-2647-1869		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 153				46.11%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-0.933	1.94	1.44	6	CDF	0.8065	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.42	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.901333	0.901333	1	0.87	0.3870	Non-Significant Effect					
Error	6.21867	1.03644	6								
Total	7.12		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.32	199	0.9471	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.93	0.645	0.5142	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-104		5	2.44	1.12	3.76	2.5	1.1	3.7	0.475	43.53%	22.13%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-104		3.7	2.5	1.1	1.7	3.2					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-0099-7436		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 153	32.44%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-2.43	1.94	1.02	6	CDF	0.9746	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.61	2.13	0.6487	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.04008	3.04008	1	5.92	0.0509	Non-Significant Effect					
Error	3.07867	0.513111	6								
Total	6.11875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.49	26.3	0.3972	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.814	0.645	0.0403	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-105		5	1.86	1.13	2.59	2	1.3	2.7	0.262	31.49%	40.64%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-105		1.3	1.3	2	2	2.7					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-3123-7262		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 170	100.60%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.216	1.94	1.2	6	CDF	0.5819	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.97	2.13	0.1480	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0333334	0.0333334	1	0.0466	0.8363	Non-Significant Effect					
Error	4.29407	0.715678	6								
Total	4.3274		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.97	199	0.3487	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.645	0.3302	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-101		5	1.06	-0.166	2.29	0.83	0.22	2.6	0.442	93.17%	11.17%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-101		0.22	2.6	0.25	0.83	1.4					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-6479-7362		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 170	87.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.462	1.94	1.05	6	CDF	0.6697	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.98	2.13	0.1367	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.116563	0.116563	1	0.213	0.6606	Non-Significant Effect					
Error	3.28219	0.547031	6								
Total	3.39875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.68	199	0.4495	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.912	0.645	0.3660	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-102		5	0.944	-0.111	2	0.86	0.22	2.3	0.38	90.04%	20.89%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-102		2.3	1.1	0.22	0.86	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-4525-4266		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 170				64.65%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	20	n/a	0	5	Exact	0.9429	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.836005	0.836005	1	3.33	0.1277	Non-Significant Effect					
Error	1.25637	0.251273	5								
Total	2.09237		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.47	199	0.8592	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.709	0.563	0.0046	Non-Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-103		4	0.495	-0.359	1.35	0.23	0.22	1.3	0.268	108.42%	58.52%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-103		1.3	0.23	0.22	0.23	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-2948-5235		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 170	59.20%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-0.741	1.94	0.706	6	CDF	0.7566	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.48	2.13	0.9289	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.136013	0.136013	1	0.549	0.4868	Non-Significant Effect					
Error	1.48699	0.247831	6								
Total	1.623		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.4	199	0.9160	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.878	0.645	0.1793	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-104		5	0.924	0.274	1.57	0.76	0.24	1.5	0.234	56.62%	22.57%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-104		1.5	0.72	0.24	0.76	1.4					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-3374-0487		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 170	62.57%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-3.75	2.92	0.747	2	CDF	0.9679	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.14	2.13	0.0447	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.7256	1.7256	1	26.4	0.0021	Significant Effect					
Error	0.392387	0.0653978	6								
Total	2.11799		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6540	26.3	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.802	0.645	0.0300	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	80.39%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 10-4295-7295		Endpoint: PCB 180			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-101 passed pcb 180				74.41%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.0696	1.94	2.23	6	CDF	0.4734	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test		1.94	2.13	0.1740		No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.012		0.012	1	0.00485	0.9467	Non-Significant Effect				
Error	14.848		2.47467	6							
Total	14.86			7							
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Variance Ratio F Test		7.08	199	0.2553		Equal Variances				
Distribution	Shapiro-Wilk W Normality Test		0.947	0.645	0.6808		Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-101		5	3.08	0.768	5.39	3.2	1.2	5.9	0.833	60.45%	-2.67%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-101		1.2	5.9	1.6	3.5	3.2					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-7894-8349		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 180	68.41%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.208	1.94	2.05	6	CDF	0.5791	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.11	2.13	0.0589	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.09075	0.09075	1	0.0434	0.8419	Non-Significant Effect					
Error	12.548	2.09133	6								
Total	12.6387		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.9	199	0.3002	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.882	0.645	0.1948	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-102		5	2.78	0.668	4.89	2.6	1.3	5.6	0.761	61.17%	7.33%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-102		5.6	2.8	1.3	2.6	1.6					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-3430-4088		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 180	96.11%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	0.189	1.94	2.88	6	CDF	0.4283	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.19	2.13	0.0278	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.147	0.147	1	0.0356	0.8565	Non-Significant Effect					
Error	24.768	4.128	6								
Total	24.915		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	12.1	199	0.1551	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.831	0.645	0.0605	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-103		5	3.28	0.252	6.31	2.1	1.6	7.4	1.09	74.35%	-9.33%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-103		3.6	2.1	1.6	1.7	7.4					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-7663-0908		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 180				43.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.17	2.02	1.3	5	CDF	0.8518	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.964286	0.964286	1	1.36	0.2964	Non-Significant Effect					
Error	3.55	0.71	5								
Total	4.51429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.75	199	0.7681	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.563	0.0622	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-103		4	2.25	0.777	3.72	1.9	1.6	3.6	0.463	41.14%	25.00%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-103		3.6	2.1	1.6	1.7	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-2098-3420		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 180	52.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-1.03	1.94	1.57	6	CDF	0.8291	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.13	0.8957	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.30417	1.30417	1	1.07	0.3418	Non-Significant Effect					
Error	7.34512	1.22419	6								
Total	8.64929		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.25	199	0.4981	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.95	0.645	0.7107	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-104		5	2.17	0.6	3.73	2.2	0.85	3.7	0.564	58.24%	27.80%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-104		3.7	2.2	0.98	0.85	3.1					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-7383-6251		Endpoint: PCB 180			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-105 passed pcb 180				29.23%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-3.91	1.94	0.877	6	CDF	0.9961	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.4	2.13	1.0000	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.83443	5.83443	1	15.3	0.0079	Significant Effect					
Error	2.29072	0.381787	6								
Total	8.12515		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.5	26.3	0.6548	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.881	0.645	0.1931	Normal Distribution				
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-105		5	1.24	0.525	1.95	1.4	0.64	1.9	0.256	46.31%	58.80%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-105		0.64	0.64	1.4	1.6	1.9					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-7573-1430		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-101 passed pcb 183			66.85%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.423	1.94	0.604	6	CDF	0.6564	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.59	2.13	0.6779	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0323408	0.0323408	1	0.179	0.6873	Non-Significant Effect					
Error	1.08635	0.181058	6								
Total	1.11869		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	35.1	199	0.0558	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.937	0.645	0.5832	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-101		5	0.772	0.129	1.41	0.99	0.22	1.4	0.231	67.03%	14.54%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-101		0.22	1.4	0.25	1	0.99					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-0718-8224		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 183				64.04%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.125	1.94	0.579	6	CDF	0.5478	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.21	2.13	0.0227	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0026133	0.0026133	1	0.0157	0.9043	Non-Significant Effect					
Error	0.997187	0.166198	6								
Total	0.9998		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	32.2	199	0.0608	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.645	0.0650	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-102		5	0.866	0.251	1.48	0.76	0.44	1.7	0.222	57.21%	4.13%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-102		1.7	0.76	0.44	0.87	0.56					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-5453-7674		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 passed pcb 183			81.65%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	0.255	1.94	0.738	6	CDF	0.4037	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.29	2.13	0.0084	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0175208	0.0175208	1	0.0649	0.8075	Non-Significant Effect					
Error	1.62087	0.270144	6								
Total	1.63839		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	52.6	199	0.0375	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.769	0.645	0.0133	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-103		5	1	0.213	1.79	0.76	0.58	2.1	0.283	63.36%	-10.70%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-103		0.96	0.76	0.6	0.58	2.1					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-8137-2925		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-103 passed pcb 183			25.08%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.59	2.02	0.227	5	CDF	0.9132	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.054519	0.054519	1	2.52	0.1736	Non-Significant Effect					
Error	0.108367	0.0216733	5								
Total	0.162886		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.07	199	0.4074	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.94	0.563	0.6428	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-103		4	0.725	0.445	1.01	0.68	0.58	0.96	0.0881	24.30%	19.74%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-103		0.96	0.76	0.6	0.58	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-5927-8654		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 183				49.45%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-1.22	1.94	0.447	6	CDF	0.8665	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.64	2.13	0.5863	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.148403	0.148403	1	1.5	0.2669	Non-Significant Effect					
Error	0.594547	0.0990911	6								
Total	0.74295		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	19	199	0.1014	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.947	0.645	0.6784	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-104		5	0.622	0.149	1.09	0.67	0.24	1.1	0.17	61.18%	31.14%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-104		1.1	0.67	0.24	0.24	0.86					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-5350-5683		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 183	21.94%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-4.8	1.94	0.198	6	CDF	0.9985	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.35	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.448963	0.448963	1	23	0.0030	Significant Effect					
Error	0.116987	0.0194978	6								
Total	0.56595		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.33	199	0.4879	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.853	0.645	0.1010	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-105		5	0.414	0.216	0.612	0.51	0.24	0.55	0.0713	38.52%	54.17%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-105		0.24	0.24	0.55	0.51	0.53					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-5981-0283		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 184				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-0938-3976		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-102 passed pcb 184				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-7215-3017		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 184				3.34%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-7557-8631	Endpoint:	PCB 184	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 13:15	Analysis:	Nonparametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C < T			31243-104 passed pcb 184				2.96%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.75	2.13	0.4021	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.67	26.3	0.5950	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.685	0.645	0.0015	Non-Normal Distribution				
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-1375-7949		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 184	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-5957-0471		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 187	66.07%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.512	1.94	1.5	6	CDF	0.6866	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.87	2.13	0.2399	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.292053	0.292053	1	0.262	0.6269	Non-Significant Effect					
Error	6.68175	1.11362	6								
Total	6.9738		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.67	199	0.3684	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.928	0.645	0.4964	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-101		5	1.87	0.347	3.4	1.7	0.77	3.7	0.549	65.62%	17.41%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-101		0.77	3.7	0.79	2.4	1.7					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-3800-4211		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 187	62.30%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.455	1.94	1.41	6	CDF	0.6675	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.02	2.13	0.1054	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.205013	0.205013	1	0.207	0.6651	Non-Significant Effect					
Error	5.94059	0.990098	6								
Total	6.1456		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.09	199	0.4117	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.915	0.645	0.3930	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-102		5	1.94	0.508	3.36	1.9	0.88	3.8	0.514	59.42%	14.59%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-102		3.8	2	0.88	1.9	1.1					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-3753-3198		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 187	73.08%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	0.18	1.94	1.66	6	CDF	0.4316	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.2	2.13	0.0245	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0440834	0.0440834	1	0.0324	0.8632	Non-Significant Effect					
Error	8.17467	1.36244	6								
Total	8.21875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.82	199	0.3039	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.786	0.645	0.0204	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-103		5	2.42	0.717	4.12	1.7	1.6	4.8	0.614	56.69%	-6.76%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-103		2.4	1.7	1.6	1.6	4.8					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-2254-3262		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-103 passed pcb 187				31.76%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.24	2.02	0.72	5	CDF	0.8644	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.334405	0.334405	1	1.53	0.2713	Non-Significant Effect					
Error	1.09417	0.218833	5								
Total	1.42857		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.17	49.8	0.5231	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.811	0.563	0.0524	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-103		4	1.83	1.21	2.44	1.65	1.6	2.4	0.193	21.16%	19.49%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-103		2.4	1.7	1.6	1.6	Outlier					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-1257-3872		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-104 passed pcb 187				52.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	-1.38	1.94	1.18	6	CDF	0.8916	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.54	2.13	0.8047	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.3251	1.3251	1	1.91	0.2167	Non-Significant Effect					
Error	4.17299	0.695498	6								
Total	5.49809		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.73	199	0.5718	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.955	0.645	0.7624	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-104		5	1.43	0.26	2.59	1.6	0.24	2.4	0.42	65.84%	37.09%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-104		2.4	1.6	0.24	0.69	2.2					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-2981-2114		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 187	30.56%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-3.95	1.94	0.693	6	CDF	0.9962	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.4	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.71008	3.71008	1	15.6	0.0076	Significant Effect					
Error	1.42987	0.238311	6								
Total	5.13995		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.65	26.3	0.6000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.945	0.645	0.6646	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-105		5	0.86	0.311	1.41	1.1	0.24	1.3	0.198	51.45%	62.06%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-105		0.24	0.56	1.3	1.1	1.1					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-7546-3061		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-101 passed pcb 195	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	19-1370-2237		Endpoint:	PCB 195		CETIS Version:	CETISv1.9.3				
Analyzed:	22 Mar-19 13:14		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C < T		31243-102 passed pcb 195			6.77%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.105	2.02	0.016	5	CDF	0.4603	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	1.190E-06		1.190E-06		1	0.011	0.9206	Non-Significant Effect			
Error	0.0005417		0.0001083		5						
Total	0.0005429				6						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			4.75	199	0.3576	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.881	0.563	0.2294	Normal Distribution				
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		4	0.237	0.217	0.258	0.24	0.22	0.25	0.00629	5.30%	-0.35%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		Outlier	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7805-3667		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 195	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis **EnviroSystems, Inc.**

Analysis ID: 05-7084-7074	Endpoint: PCB 195	CETIS Version: CETISv1.9.3
Analyzed: 22 Mar-19 13:15	Analysis: Nonparametric-Two Sample	Official Results: Yes

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018	
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	31243-104 passed pcb 195	2.96%

Wilcoxon Rank Sum Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect

Auxiliary Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)	
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected	

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect
Error	0.0001467	2.444E-05	6			
Total	0.00015		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution	

PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%

PCB 195 Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
31250-PRE	PR	0.24	0.24	0.23			
31243-104		0.24	0.23	0.24	0.24	0.24	

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-4211-0443		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-105 passed pcb 195	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-0890-0996		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 206				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-6035-2536		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-102 passed pcb 206	6.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-8052-7394		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 206	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-1891-8588		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-104 passed pcb 206	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-0662-5839		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 206			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-6605-9929		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:13		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C < T	31243-101 passed pcb 209				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-0.76	1.94	0.017	6	CDF	0.7619	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-6195-0269		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-102 passed pcb 209			6.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.319	1.94	0.016	6	CDF	0.6197	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-2763-4262		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:14		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C < T	31243-103 passed pcb 209	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.11	1.94	0.008	6	CDF	0.9896	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

CETIS Analytical Report

Report Date: 22 Mar-19 13:38 (p 145 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 07-5955-6352		Endpoint: PCB 209			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 13:15		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C < T		31243-104 passed pcb 209				2.96%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	21.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.75	2.13	0.4021	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.67	26.3	0.5950	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.685	0.645	0.0015	Non-Normal Distribution					
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 13:38 (p 146 of 146)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-2868-6187		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 13:15		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C < T	31243-105 passed pcb 209			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	-0.655	1.94	0.008	6	CDF	0.7315	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

Nereis virens
28 day Bioaccumulation Evaluation

Statistical Analysis

Evaluation of PCB Congeners in Pre-Tissue
Pre-Tissue > Treatment

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly > Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	1.020462	2.91999	0.2074271	0.05	FALSE	1.42118	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.9449109	2.01505	0.1940459	0.05	FALSE	0.02132527	5		C
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.909674	2.91999	0.2295083	0.05	FALSE	4.945425	2		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 2	20		0.5714286	0.05	FALSE		5	2	E
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	1.079662	2.91999	0.1965933	0.05	FALSE	0.3606048	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.9449109	2.01505	0.1940459	0.05	FALSE	0.02132527	5		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	-2.502038	1.94318	0.9767999	0.05	FALSE	0.21953	6		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.4975708	1.94318	0.3182465	0.05	FALSE	0.2473378	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 2	23		0.5535714	0.05	FALSE		6	2	E
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.4479309	2.01505	0.3364722	0.05	FALSE	0.01874404	5		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 128	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 2	23		0.5535714	0.05	FALSE		6	2	E
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.4479309	2.01505	0.3364722	0.05	FALSE	0.01874404	5		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.6758453	1.94318	0.2621593	0.05	FALSE	1.035066	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.07065611	1.94318	0.4729838	0.05	FALSE	2.016807	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.2158146	1.94318	0.418141	0.05	FALSE	1.200525	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	-0.0696358	1.94318	0.5266268	0.05	FALSE	2.232394	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.4226365	1.94318	0.343644	0.05	FALSE	0.6038389	6		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.5121081	1.94318	0.3134365	0.05	FALSE	1.497552	6		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 2	0.7595546	1.94318	0.2381468	0.05	FALSE	0.01705544	6		C
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	1.012252	2.91999	0.2089814	0.05	FALSE	1.421168	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.597614	2.01505	0.2880659	0.05	FALSE	0.02023092	5		C
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	1.003551	2.91999	0.2106427	0.05	FALSE	4.925074	2		C
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.597614	2.01505	0.2880659	0.05	FALSE	0.02023092	5		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly > Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	1.04741	2.91999	0.2024148	0.05	FALSE	0.3605575	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.597614	2.01505	0.2880659	0.05	FALSE	0.02023092	5		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 3	22		0.5	0.05	FALSE		6	1	E
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	-0.2574721	1.94318	0.5972915	0.05	FALSE	0.2616346	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 3	25		0.8035714	0.05	FALSE		6	2	E
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	-0.1048284	2.01505	0.5397063	0.05	FALSE	0.01601861	5		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.776114	1.94318	0.2335815	0.05	FALSE	1.151716	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.106522	1.94318	0.4593202	0.05	FALSE	2.067429	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.4616098	1.94318	0.3303116	0.05	FALSE	1.049587	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.2083108	1.94318	0.4209388	0.05	FALSE	2.052221	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.1253963	1.94318	0.452153	0.05	FALSE	0.5785289	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	2.013729	2.01505	0.05008423	0.05	FALSE	0.2459944	5		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.4550425	1.94318	0.3325399	0.05	FALSE	1.412055	6		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 3	25		0.8035714	0.05	FALSE		6	2	E
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	-0.1048284	2.01505	0.5397063	0.05	FALSE	0.01601861	5		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 3	0.3188965	1.94318	0.3803073	0.05	FALSE	0.01624921	6		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 4	17.5		0.1071429	0.05	FALSE		6	1	E
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	0.6125021	1.94318	0.2813421	0.05	FALSE	2.590899	6		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 049	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 4	18		0.1071429	0.05	FALSE		6	0	E
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	1.121314	2.91999	0.1893542	0.05	FALSE	0.3602302	2		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-3.485831	1.94318	0.9934753	0.05	FALSE	0.3526807	6		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly > Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-1.466144	1.94318	0.9035163	0.05	FALSE	0.4780159	6		C
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-0.2996103	1.94318	0.6127088	0.05	FALSE	1.68628	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	1.009662	2.01505	0.1794965	0.05	FALSE	0.6985179	5		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-0.4468236	1.94318	0.6646608	0.05	FALSE	2.638319	6		C
PCB 153	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 4	13		0.1142857	0.05	FALSE		5	1	E
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	0.1121063	1.94318	0.4571978	0.05	FALSE	1.687115	6		C
PCB 170	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 4	12		0.1142857	0.05	FALSE		5	0	E
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-0.1887074	1.94318	0.5717283	0.05	FALSE	2.88325	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	1.165397	2.01505	0.1482129	0.05	FALSE	1.2968	5		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-0.2546709	1.94318	0.5962594	0.05	FALSE	0.7375823	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	1.58603	2.01505	0.08679551	0.05	FALSE	0.2265723	5		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	-0.179878	1.94318	0.5684152	0.05	FALSE	1.656425	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	1.236173	2.01505	0.1356479	0.05	FALSE	0.7199473	5		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 4	3.109604	1.94318	0.01042969	0.05	TRUE	0.00791535	6		C
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.004101	2.91999	0.2105372	0.05	FALSE	1.421072	2		C
PCB 008	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	19		0.2857143	0.05	FALSE		5	2	E
PCB 018	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.001185	2.91999	0.2110969	0.05	FALSE	4.925046	2		C
PCB 018	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	19		0.2857143	0.05	FALSE		5	2	E
PCB 028	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 044	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.016083	2.91999	0.2082546	0.05	FALSE	0.3601789	2		C
PCB 049	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	19		0.2857143	0.05	FALSE		5	2	E
PCB 052	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.017489	2.91999	0.2079885	0.05	FALSE	0.3309832	2		C
PCB 052	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	19		0.2857143	0.05	FALSE		5	2	E
PCB 066	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 087	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly > Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	0.8314714	1.94318	0.2187695	0.05	FALSE	0.246168	6		C
PCB 105	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 118	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 128	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.678744	1.94318	0.07210398	0.05	FALSE	0.923701	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	0.9325446	1.94318	0.1935216	0.05	FALSE	1.444726	6		C
PCB 170	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	0.7408203	1.94318	0.2433858	0.05	FALSE	0.7064645	6		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.03215	1.94318	0.1708997	0.05	FALSE	1.570132	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.223783	1.94318	0.1334535	0.05	FALSE	0.4467143	6		C
PCB 184	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 5	1.38031	1.94318	0.1083569	0.05	FALSE	1.183478	6		C
PCB 195	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 206	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 209	Wilcoxon Rank Sum Two-Sample Test	Pre-Tissue	PR	>	Comp 5	23.5		0.6428571	0.05	FALSE		6	3	E
PCB 008	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.012316	2.91999	0.2089692	0.05	FALSE	1.421078	2		C
PCB 008	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.46385	2.01505	0.1015553	0.05	FALSE	0.00825923	5		C
PCB 018	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6885809	1.94318	0.2584064	0.05	FALSE	2.931125	6		C
PCB 028	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 044	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 049	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.048442	2.91999	0.2022256	0.05	FALSE	0.3602026	2		C
PCB 049	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.46385	2.01505	0.1015553	0.05	FALSE	0.00825923	5		C
PCB 052	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.052695	2.91999	0.2014477	0.05	FALSE	0.331009	2		C
PCB 052	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	1.46385	2.01505	0.1015553	0.05	FALSE	0.00825923	5		C
PCB 066	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 087	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 101	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	2.055571	2.91999	0.08807342	0.05	FALSE	0.2689523	2		C
PCB 101	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	31.45613	2.01505	3.0669E-07	0.05	TRUE	0.01800058	5		C
PCB 105	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 118	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 128	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 138	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	4.00272	1.94318	0.00354848	0.05	TRUE	0.5679939	6		C
PCB 153	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	2.434092	1.94318	0.02543929	0.05	TRUE	1.016525	6		C

STUDY: 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP
ASSAY: *N. virens* 28-day Bioaccumulation Evaluation
TASK: Statistical Analysis of Body Burden PCBs
QUESTION: Is Pre-Test Tissue Significantly > Treatment?

Endpoint	Method	Group 1	Code 1	Group 2	Code 2	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 170	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	3.751755	2.91999	0.0321356	0.05	TRUE	0.7466477	2		C
PCB 170	Unequal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	11.75687	6.31375	0.02700936	0.05	TRUE	0.3791407	1		C
PCB 180	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	3.909209	1.94318	0.0039498	0.05	TRUE	0.876845	6		C
PCB 183	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	4.798582	1.94318	0.00150255	0.05	TRUE	0.198155	6		C
PCB 184	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 187	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	3.94566	1.94318	0.00378763	0.05	TRUE	0.6927629	6		C
PCB 195	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 206	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C
PCB 209	Equal Variance t Two-Sample Test	Pre-Tissue	PR	>	Comp 6	0.6546537	1.94318	0.2684817	0.05	FALSE	0.00791534	6		C

CETIS Analytical Report

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-9626-3663		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-101 passed pcb 008				8.89%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.945	2.02	0.021	5	CDF	0.1940	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0001429	0.0001429	1	0.893	0.3881	Non-Significant Effect					
Error	0.0008	0.00016	5								
Total	0.0009429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	12.9	16.3	0.0158	Equal Variances						
Variances	Mod Levene Equality of Variance Test	1.23	21.2	0.3288	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.856	0.563	0.1386	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	4.17%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-101		0.22	0.22	0.25	0.22	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 2 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-8866-5544		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 008				195.57%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	1.01	2.92	1.42	2	CDF	0.2090	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0375	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.455101	0.455101	1	1.92	0.2151	Non-Significant Effect					
Error	1.42179	0.236964	6								
Total	1.87689		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3950	26.3	5.1E-07	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.771	0.645	0.0139	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	67.80%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 3 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-9399-3902		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 008				8.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.598	2.02	0.020	5	CDF	0.2881	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 4 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 12-4022-3320		Endpoint: PCB 008			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C > T		31243-103 passed pcb 008				141.76%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	17.5	n/a	1	6	Exact	0.1071	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.76	2.13	0.3899	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0800833	0.0800833	1	0.152	0.7101	Non-Significant Effect					
Error	3.16167	0.526944	6								
Total	3.24175		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.63	26.3	0.6062	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.686	0.645	0.0016	Non-Normal Distribution					
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31243-103		5	0.52	-0.299	1.34	0.23	0.22	1.7	0.295	126.86%	28.44%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31243-103		0.22	0.23	1.7	0.23	0.22					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 5 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-2736-0287		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-104 passed pcb 008				195.56%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1	2.92	1.42	2	CDF	0.2105	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0373	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.447741	0.447741	1	1.89	0.2183	Non-Significant Effect					
Error	1.42115	0.236858	6								
Total	1.86889		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	35500	26.3	<1.0E-37	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.761	0.645	0.0107	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.727	-1.37	2.82	0.24	0.24	1.7	0.487	116.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	67.25%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	1.7							
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 6 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-3379-2665		Endpoint: PCB 008		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-105 passed pcb 008			3.44%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	1.46	2.02	0.008	5	CDF	0.1016	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	2.14	0.2031	Non-Significant Effect					
Error	0.00012	0.000024	5								
Total	0.0001714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	34.3	16.3	0.0021	Unequal Variances						
Variances	Mod Levene Equality of Variance Test	1.33	21.2	0.3125	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.805	0.563	0.0454	Normal Distribution						
PCB 008 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	2.50%
PCB 008 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-105		0.24	0.24	0.23	0.23						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-8581-6908		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 018	256.68%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.91	2.92	4.95	2	CDF	0.2295	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.13	2.13	0.0482	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.4506	4.4506	1	1.52	0.2634	Non-Significant Effect					
Error	17.541	2.9235	6								
Total	21.9916		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	72.3	26.3	0.0014	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.821	0.645	0.0482	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-101		5	0.386	-0.0405	0.812	0.24	0.22	1	0.154	88.99%	79.97%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-101		0.22	1	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0581-7559	Endpoint: PCB 018		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 14:08	Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31243-102 passed pcb 018			8.43%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.598	2.02	0.020	5	CDF	0.2881	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-3237-9494		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 passed pcb 018	134.48%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	0.613	1.94	2.59	6	CDF	0.2813	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.13	0.1249	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.25052	1.25052	1	0.375	0.5627	Non-Significant Effect					
Error	19.9999	3.33331	6								
Total	21.2504		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	11.6	26.3	0.0429	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.894	0.645	0.2534	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-103		5	1.11	0.0472	2.17	1.3	0.22	2.1	0.383	77.12%	42.39%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-103		1.7	1.3	2.1	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-8891-1039		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-104 passed pcb 018				2.81%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	19	n/a	2	5	Exact	0.2857	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	2.54	16.3	0.1719	Equal Variances						
Variances	Mod Levene Equality of Variance Test	0.444	21.2	0.5415	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.634	0.563	6.7E-04	Non-Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-6611-4994		Endpoint: PCB 018		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 018	152.13%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.689	1.94	2.93	6	CDF	0.2584	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.76	2.13	0.3777	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.0228	2.0228	1	0.474	0.5168	Non-Significant Effect					
Error	25.5973	4.26622	6								
Total	27.6202		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4	26.3	0.2220	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.764	0.645	0.0118	Normal Distribution						
PCB 018 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.93	-5.33	9.18	0.24	0.24	5.3	1.69	151.63%	0.00%
31243-105		5	0.888	-0.925	2.7	0.24	0.23	3.5	0.653	164.43%	53.91%
PCB 018 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	5.3							
31243-105		0.24	0.24	3.5	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-4603-9902		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-101 passed pcb 028			7.21%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-5662-3983		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 028				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-7695-8583		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 028	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-6476-5983		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 028	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8947-7173		Endpoint: PCB 028		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 028	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 028 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 028 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-6191-9723		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-101 passed pcb 044				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-3196-7285		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-102 passed pcb 044			6.87%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Report Date: 22 Mar-19 14:15 (p 19 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-3704-9490		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 044	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-1667-7877		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31243-104 passed pcb 044			2.96%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.75	2.13	0.4021	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.67	26.3	0.5950	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.685	0.645	0.0015	Non-Normal Distribution					
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-6410-3315		Endpoint: PCB 044		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 044	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 044 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 044 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Report Date: 22 Mar-19 14:15 (p 22 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-5809-1109		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 049	99.25%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	1.08	2.92	0.361	2	CDF	0.1966	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.15	2.13	0.0406	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0333333	0.0333333	1	2.17	0.1909	Non-Significant Effect					
Error	0.0920667	0.0153444	6								
Total	0.1254		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	228	26.3	1.5E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.808	0.645	0.0347	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	36.70%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Report Date: 22 Mar-19 14:15 (p 23 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-1425-1637		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 049	99.24%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	1.05	2.92	0.361	2	CDF	0.2024	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.15	2.13	0.0403	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0313633	0.0313633	1	2.05	0.2026	Non-Significant Effect					
Error	0.0919867	0.0153311	6								
Total	0.12335		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	254	26.3	1.2E-04	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.808	0.645	0.0346	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	35.60%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Report Date: 22 Mar-19 14:15 (p 24 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-8045-3716		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 049	8.43%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.598	2.02	0.020	5	CDF	0.2881	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	0.357	0.5761	Non-Significant Effect					
Error	0.00072	0.000144	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	9.66	16.3	0.0266	Equal Variances						
Variances	Mod Levene Equality of Variance Test	3.03	21.2	0.1567	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.91	0.563	0.3976	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	2.50%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-8456-6088		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-103 passed pcb 049				99.15%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	1.12	2.92	0.36	2	CDF	0.1894	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0328048	0.0328048	1	1.8	0.2380	Non-Significant Effect					
Error	0.0913667	0.0182733	5								
Total	0.124171		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1370	49.8	7.2E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.803	0.563	0.0438	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-103		4	0.225	0.216	0.234	0.225	0.22	0.23	0.00289	2.57%	38.07%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-103		0.22	0.23	Outlier	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-6505-8892		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 049	99.13%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1.02	2.92	0.36	2	CDF	0.2083	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0376	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0294533	0.0294533	1	1.93	0.2136	Non-Significant Effect					
Error	0.0913467	0.0152244	6								
Total	0.1208		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2280	26.3	1.5E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.77	0.645	0.0137	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	34.50%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	04-2889-7160		Endpoint:	PCB 049		CETIS Version:	CETISv1.9.3				
Analyzed:	22 Mar-19 14:10		Analysis:	Nonparametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31243-104 passed pcb 049			2.81%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	19	n/a	2	5	Exact	0.2857	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.714E-06	5.714E-06	1	0.357	0.5761	Non-Significant Effect					
Error	8E-05	0.000016	5								
Total	8.571E-05		6								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Levene Equality of Variance Test		2.54	16.3	0.1719	Equal Variances					
Variances	Mod Levene Equality of Variance Test		0.444	21.2	0.5415	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.634	0.563	6.7E-04	Non-Normal Distribution					
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-3985-1591		Endpoint: PCB 049		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-105 passed pcb 049				99.14%					
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	1.05	2.92	0.36	2	CDF	0.2022	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.16	2.13	0.0378	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0313633	0.0313633	1	2.06	0.2013	Non-Significant Effect					
Error	0.0913867	0.0152311	6								
Total	0.12275		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1520	26.3	3.4E-06	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.777	0.645	0.0163	Normal Distribution						
PCB 049 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.363	-0.167	0.894	0.24	0.24	0.61	0.123	58.79%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	35.60%
PCB 049 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.61							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-5236-9159		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 052	62.13%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	-2.5	1.94	0.22	6	CDF	0.9768	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.58	2.13	0.7020	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.149813	0.149813	1	6.26	0.0464	Significant Effect					
Error	0.143587	0.0239311	6								
Total	0.2934		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.32	26.3	0.4292	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.848	0.645	0.0915	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-101		5	0.636	0.476	0.796	0.64	0.5	0.82	0.0577	20.28%	-80.00%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-101		0.5	0.69	0.82	0.53	0.64					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-3675-2760		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 052				68.97%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	22	n/a	1	6	Exact	0.5000	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.77	2.13	0.3637	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0038533	0.0038533	1	0.131	0.7301	Non-Significant Effect					
Error	0.176947	0.0294911	6								
Total	0.1808		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.54	26.3	0.6372	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.7	0.645	0.0023	Non-Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	12.83%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-102		0.59	0.24	0.22	0.25	0.24					

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Report Date: 22 Mar-19 14:15 (p 31 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-4078-9690		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-103 passed pcb 052				99.82%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-3.49	1.94	0.353	6	CDF	0.9935	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.63	2.13	0.5978	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.750501	0.750501	1	12.2	0.0130	Significant Effect					
Error	0.370587	0.0617644	6								
Total	1.12109		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.9	199	0.7453	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.953	0.645	0.7434	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.353	-0.134	0.841	0.24	0.24	0.58	0.113	55.56%	0.00%
31243-103		5	0.986	0.65	1.32	1.1	0.61	1.3	0.121	27.47%	-179.06%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.58							
31243-103		0.82	1.1	1.1	0.61	1.3					

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Report Date: 22 Mar-19 14:15 (p 32 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	18-1697-9429	Endpoint:	PCB 052	CETIS Version:	CETISv1.9.3						
Analyzed:	22 Mar-19 14:10	Analysis:	Nonparametric-Two Sample	Official Results:	Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C > T			31243-104 passed pcb 052				2.81%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	19	n/a	2	5	Exact	0.2857	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	5.714E-06		5.714E-06		1	0.357	0.5761	Non-Significant Effect			
Error	8E-05		0.000016		5						
Total	8.571E-05				6						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Levene Equality of Variance Test			2.54	16.3	0.1719	Equal Variances				
Variances	Mod Levene Equality of Variance Test			0.444	21.2	0.5415	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.634	0.563	6.7E-04	Non-Normal Distribution				
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	0.83%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-104		0.24	0.23	0.24	0.24						

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Report Date: 22 Mar-19 14:15 (p 33 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-6652-3427		Endpoint: PCB 052		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-105 passed pcb 052				3.44%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	1.46	2.02	0.008	5	CDF	0.1016	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.143E-05	5.143E-05	1	2.14	0.2031	Non-Significant Effect					
Error	0.00012	0.000024	5								
Total	0.0001714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Levene Equality of Variance Test	34.3	16.3	0.0021	Unequal Variances						
Variances	Mod Levene Equality of Variance Test	1.33	21.2	0.3125	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.805	0.563	0.0454	Normal Distribution						
PCB 052 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	2	0.24	0.239	0.241	0.24	0.24	0.24	0	0.00%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	2.50%
PCB 052 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	Outlier							
31243-105		0.24	0.24	0.23	0.23						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-2392-8953		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-101 passed pcb 066				7.21%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-4044-0214		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 066				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-0830-2414		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 066	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-8120-8955		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 066	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-9084-9490		Endpoint: PCB 066		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-105 passed pcb 066			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 066 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 066 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-7103-7565		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 087	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-9363-8593		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 087				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-4703-1074		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 087	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-4893-9961		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 087	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-8956-7835		Endpoint: PCB 087		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-105 passed pcb 087			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 087 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 087 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-0607-6238		Endpoint: PCB 101		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C > T			31243-101 passed pcb 101				58.43%			
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.498	1.94	0.247	6	CDF	0.3182	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.49	2.13	0.9208	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0075208		0.0075208	1	0.248	0.6365	Non-Significant Effect				
Error	0.182267		0.0303778	6							
Total	0.189787			7							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.29	199	0.9605	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.885	0.645	0.2097	Normal Distribution				
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-101		5	0.36	0.135	0.585	0.25	0.22	0.6	0.0811	50.35%	14.96%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-101		0.22	0.51	0.25	0.22	0.6					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-0591-5961		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 101	61.80%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.257	1.94	0.262	6	CDF	0.5973	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.28	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0022533	0.0022533	1	0.0663	0.8054	Non-Significant Effect					
Error	0.203947	0.0339911	6								
Total	0.2062		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.5	199	0.8732	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.785	0.645	0.0197	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-102		5	0.458	0.215	0.701	0.57	0.24	0.63	0.0875	42.71%	-8.19%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-102		0.63	0.57	0.6	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-2063-5820		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 passed pcb 101	112.92%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-1.47	1.94	0.478	6	CDF	0.9035	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.78	2.13	0.3597	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.243901	0.243901	1	2.15	0.1930	Non-Significant Effect					
Error	0.680787	0.113464	6								
Total	0.924687		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6.19	199	0.2877	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.974	0.645	0.9259	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-103		5	0.784	0.291	1.28	0.71	0.23	1.3	0.177	50.62%	-85.20%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-103		0.71	0.69	0.99	0.23	1.3					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2710-9473		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 101	58.15%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	0.831	1.94	0.246	6	CDF	0.2188	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2	2.13	0.1181	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0208033	0.0208033	1	0.691	0.4375	Non-Significant Effect					
Error	0.180547	0.0300911	6								
Total	0.20135		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.27	199	0.9682	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.862	0.645	0.1246	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819	0.5	0.24	0.53	0.0921	37.67%	0.00%
31243-104		5	0.318	0.0944	0.542	0.24	0.23	0.64	0.0805	56.62%	24.88%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-104		0.64	0.23	0.24	0.24	0.24					

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Report Date: 04 Apr-19 16:17 (p 2 of 3)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-5009-8305		Endpoint: PCB 101		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 101	63.53%								
Unequal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	2.06	2.92	0.269	2	CDF	0.0881	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.15	2.13	0.0416	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0672133	0.0672133	1	7.91	0.0307	Significant Effect					
Error	0.0509867	0.0084978	6								
Total	0.1182		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	848	26.3	1.1E-05	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.811	0.645	0.0371	Normal Distribution						
PCB 101 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.423	0.0272	0.819		0.24	0.53	0.0921	37.67%	0.00%
31243-105		5	0.234	0.227	0.241		0.23	0.24	0.00245	2.34%	44.72%
PCB 101 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.5	0.24	0.53							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Report Date: 22 Mar-19 14:15 (p 48 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 16-2460-0283		Endpoint: PCB 101		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes								
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h								
Sample Code	Material Type	Sample Source		Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018		Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp		Comparison Result			PMSD						
Untransformed	C > T		31243-105 failed pcb 101			3.50%						
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Pre-Test Tissue		31243-105*	31.5	2.02	0.018	5	CDF	3.1E-07	Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.112801		0.112801	1	989	6.1E-07	Significant Effect					
Error	0.00057		0.000114	5								
Total	0.113371			6								
Distributional Tests												
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test			15	31.3	0.0359	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test			0.939	0.563	0.6295	Normal Distribution					
PCB 101 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	2	0.515	0.324	0.706	0.515	0.5	0.53	0.015	4.12%	0.00%	
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	54.56%	
PCB 101 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	0.5	Outlier	0.53								
31243-105		0.24	0.24	0.23	0.23	0.23						

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Report Date: 22 Mar-19 14:15 (p 49 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 14-4553-1894		Endpoint: PCB 105			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 14:07		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C > T		31243-101 passed pcb 105				54.60%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	23	n/a	2	6	Exact	0.5536	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		2.35	2.13	0.0025	Outlier Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0038533	0.0038533	1	0.465	0.5208	Non-Significant Effect					
Error	0.0497467	0.0082911	6								
Total	0.0536		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		373	199	0.0054	Unequal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.706	0.645	0.0026	Non-Normal Distribution					
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.282	0.144	0.42	0.24	0.22	0.48	0.0498	39.52%	-19.15%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.48	0.25	0.22	0.24					

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Report Date: 22 Mar-19 14:15 (p 50 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-8288-1687		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 105				77.39%					
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	25	n/a	2	6	Exact	0.8036	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.36	2.13	0.0019	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0095408	0.0095408	1	0.573	0.4778	Non-Significant Effect					
Error	0.0999467	0.0166578	6								
Total	0.109487		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	749	199	0.0027	Unequal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.686	0.645	0.0016	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.308	0.112	0.504	0.24	0.22	0.59	0.0707	51.30%	-30.14%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.59	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-5061-3277		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 105				6.77%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.105	2.02	0.016	5	CDF	0.5397	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.190E-06	1.190E-06	1	0.011	0.9206	Non-Significant Effect					
Error	0.0005417	0.0001083	5								
Total	0.0005429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.75	199	0.3576	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.881	0.563	0.2294	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		4	0.237	0.217	0.258	0.24	0.22	0.25	0.00629	5.30%	-0.35%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		Outlier	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-5339-5549		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 105	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-6550-0772		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 105	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-7903-2805		Endpoint: PCB 105		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 105	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 105 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 105 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-1302-4000		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 118	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-4672-3626		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 118				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-9015-6574		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 118	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Report Date: 22 Mar-19 14:15 (p 58 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-9050-5807		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 118	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 17-2215-1397		Endpoint: PCB 118		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 118	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 118 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 118 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-3338-8905		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 128	7.92%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.448	2.02	0.019	5	CDF	0.3365	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.976E-05	2.976E-05	1	0.201	0.6729	Non-Significant Effect					
Error	0.0007417	0.0001483	5								
Total	0.0007714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6.75	199	0.2635	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.923	0.563	0.4935	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		4	0.232	0.209	0.256	0.23	0.22	0.25	0.0075	6.45%	1.76%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	Outlier	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	12-6295-4681		Endpoint:	PCB 128		CETIS Version:	CETISv1.9.3				
Analyzed:	22 Mar-19 14:08		Analysis:	Parametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-102	Marine Sediment	New Haven Harbor 2018		Composite 3 (US-1,-2)							
Data Transform	Alt Hyp		Comparison Result			PMSD					
Untransformed	C > T		31243-102 passed pcb 128			6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.51	2.13	0.8673	No Outliers Detected				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			5.4	199	0.3246	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.906	0.645	0.3264	Normal Distribution				
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-9748-5825		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-103 failed pcb 128			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-2957-8151		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 128	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-7460-0483		Endpoint: PCB 128		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 128	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 128 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 128 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-1832-3678		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-101 passed pcb 138				45.00%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.676	1.94	1.04	6	CDF	0.2622	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.01	2.13	0.1118	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.243	0.243	1	0.457	0.5243	Non-Significant Effect					
Error	3.192	0.532	6								
Total	3.435		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.69	199	0.5775	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.892	0.645	0.2429	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-101		5	1.94	0.921	2.96	1.9	1.2	3.3	0.367	42.29%	15.65%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-101		1.2	3.3	1.4	1.9	1.9					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-1901-5139		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 138	50.07%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.776	1.94	1.15	6	CDF	0.2336	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.08	2.13	0.0738	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.39675	0.39675	1	0.602	0.4672	Non-Significant Effect					
Error	3.952	0.658667	6								
Total	4.34875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.45	199	0.4741	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.879	0.645	0.1843	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-102		5	1.84	0.687	2.99	1.6	1.1	3.4	0.415	50.49%	20.00%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-102		3.4	1.9	1.1	1.6	1.2					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 04-3743-5270		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 passed pcb 138	73.32%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-0.3	1.94	1.69	6	CDF	0.6127	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.22	2.13	0.0207	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.12675	0.12675	1	0.0898	0.7746	Non-Significant Effect					
Error	8.472	1.412	6								
Total	8.59875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	7.97	199	0.2291	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.829	0.645	0.0575	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-103		5	2.56	0.807	4.31	2.1	1.4	5	0.631	55.15%	-11.30%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-103		2.4	2.1	1.9	1.4	5					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-3341-4701		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 138	40.16%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1.68	1.94	0.924	6	CDF	0.0721	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.66	2.13	0.5564	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.19401	1.19401	1	2.82	0.1442	Non-Significant Effect					
Error	2.54208	0.42368	6								
Total	3.73609		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.04	199	0.7094	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.985	0.645	0.9840	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-104		5	1.5	0.615	2.39	1.5	0.61	2.5	0.32	47.57%	34.70%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-104		2.5	1.5	0.61	1.1	1.8					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-2006-5530		Endpoint: PCB 138		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-105 failed pcb 138			24.70%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105*	4	1.94	0.568	6	CDF	0.0035	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.35	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.56669	2.56669	1	16	0.0071	Significant Effect					
Error	0.9612	0.1602	6								
Total	3.52789		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.17	26.3	0.4604	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.935	0.645	0.5609	Normal Distribution						
PCB 138 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.3	1.06	3.54	2.3	1.8	2.8	0.289	21.74%	0.00%
31243-105		5	1.13	0.708	1.55	1.3	0.69	1.5	0.152	30.05%	50.87%
PCB 138 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	1.8	2.3	2.8							
31243-105		0.69	0.86	1.3	1.3	1.5					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-5393-6278		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 153	64.37%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.0707	1.94	2.02	6	CDF	0.4730	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.85	2.13	0.2588	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0100833	0.0100833	1	0.00499	0.9460	Non-Significant Effect					
Error	12.1187	2.01978	6								
Total	12.1287		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.05	199	0.5237	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.952	0.645	0.7267	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-101		5	3.06	1.06	5.06	3.3	1.4	5.5	0.722	52.72%	2.34%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-101		1.4	5.5	1.8	3.3	3.3					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-7667-9269		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 153	65.98%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.107	1.94	2.07	6	CDF	0.4593	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.06	2.13	0.0821	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0240833	0.0240833	1	0.0113	0.9186	Non-Significant Effect					
Error	12.7347	2.12244	6								
Total	12.7588		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.23	199	0.5001	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.854	0.645	0.1049	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-102		5	3.02	0.958	5.08	2.5	1.7	5.8	0.743	54.98%	3.62%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-102		5.8	3.2	1.7	2.5	1.9					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-5160-5836		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-103 passed pcb 153			84.20%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-0.447	1.94	2.64	6	CDF	0.6647	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.18	2.13	0.0295	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.690084	0.690084	1	0.2	0.6707	Non-Significant Effect					
Error	20.7387	3.45644	6								
Total	21.4288		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.58	199	0.3156	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.794	0.645	0.0245	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-103		5	3.74	1.03	6.45	2.6	2.4	7.5	0.975	58.32%	-19.36%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-103		3.8	2.6	2.4	2.4	7.5					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 21-0253-9215		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 passed pcb 153	38.47%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	13	n/a	1	5	Exact	0.1143	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.190476	0.190476	1	0.311	0.6014	Non-Significant Effect					
Error	3.06667	0.613333	5								
Total	3.25714		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.88	49.8	0.5907	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.724	0.563	0.0067	Non-Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-103		4	2.8	1.73	3.87	2.5	2.4	3.8	0.337	24.05%	10.64%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-103		3.8	2.6	2.4	2.4	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-1436-9938		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 153	46.11%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	0.933	1.94	1.44	6	CDF	0.1935	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.42	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.901333	0.901333	1	0.87	0.3870	Non-Significant Effect					
Error	6.21867	1.03644	6								
Total	7.12		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.32	199	0.9471	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.93	0.645	0.5142	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-104		5	2.44	1.12	3.76	2.5	1.1	3.7	0.475	43.53%	22.13%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-104		3.7	2.5	1.1	1.7	3.2					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-3012-2560		Endpoint: PCB 153		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-105 failed pcb 153			32.44%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105*	2.43	1.94	1.02	6	CDF	0.0254	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.61	2.13	0.6487	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.04008	3.04008	1	5.92	0.0509	Non-Significant Effect					
Error	3.07867	0.513111	6								
Total	6.11875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.49	26.3	0.3972	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.814	0.645	0.0403	Normal Distribution						
PCB 153 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3.13	0.839	5.43	2.6	2.6	4.2	0.533	29.48%	0.00%
31243-105		5	1.86	1.13	2.59	2	1.3	2.7	0.262	31.49%	40.64%
PCB 153 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.6	2.6	4.2							
31243-105		1.3	1.3	2	2	2.7					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 12-0551-9882		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 170	100.60%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.216	1.94	1.2	6	CDF	0.4181	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.97	2.13	0.1480	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0333334	0.0333334	1	0.0466	0.8363	Non-Significant Effect					
Error	4.29407	0.715678	6								
Total	4.3274		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.97	199	0.3487	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.907	0.645	0.3302	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-101		5	1.06	-0.166	2.29	0.83	0.22	2.6	0.442	93.17%	11.17%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-101		0.22	2.6	0.25	0.83	1.4					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-4080-3907		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 170	87.95%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.462	1.94	1.05	6	CDF	0.3303	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.98	2.13	0.1367	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.116563	0.116563	1	0.213	0.6606	Non-Significant Effect					
Error	3.28219	0.547031	6								
Total	3.39875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.68	199	0.4495	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.912	0.645	0.3660	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-102		5	0.944	-0.111	2	0.86	0.22	2.3	0.38	90.04%	20.89%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-102		2.3	1.1	0.22	0.86	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID:	13-5624-9896		Endpoint:	PCB 170		CETIS Version:	CETISv1.9.3				
Analyzed:	22 Mar-19 14:10		Analysis:	Nonparametric-Two Sample		Official Results:	Yes				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-103	Marine Sediment	New Haven Harbor 2018		Composite 4 (DS-1,-2)							
Data Transform	Alt Hyp			Comparison Result				PMSD			
Untransformed	C > T			31243-103 passed pcb 170				64.65%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	12	n/a	0	5	Exact	0.1143	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.836005	0.836005	1	3.33	0.1277	Non-Significant Effect					
Error	1.25637	0.251273	5								
Total	2.09237		6								
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			1.47	199	0.8592	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.709	0.563	0.0046	Non-Normal Distribution				
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-103		4	0.495	-0.359	1.35	0.23	0.22	1.3	0.268	108.42%	58.52%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-103		1.3	0.23	0.22	0.23	Outlier					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-3515-1922		Endpoint: PCB 170		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-104 passed pcb 170				59.20%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	0.741	1.94	0.706	6	CDF	0.2434	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.48	2.13	0.9289	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.136013	0.136013	1	0.549	0.4868	Non-Significant Effect					
Error	1.48699	0.247831	6								
Total	1.623		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.4	199	0.9160	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.878	0.645	0.1793	Normal Distribution						
PCB 170 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	1.19	0.0932	2.29	1	0.88	1.7	0.256	37.11%	0.00%
31243-104		5	0.924	0.274	1.57	0.76	0.24	1.5	0.234	56.62%	22.57%
PCB 170 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.88	1	1.7							
31243-104		1.5	0.72	0.24	0.76	1.4					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 18-2306-9694		Endpoint: PCB 170		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018									
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C > T	31243-105 failed pcb 170	40.33%									
Unequal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Pre-Test Tissue		31243-105*	11.8	6.31	0.379	1	CDF	0.0270	Significant Effect			
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.712051	0.712051	1	486	3.6E-06	Significant Effect						
Error	0.00732	0.001464	5									
Total	0.719371		6									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	240	31.3	2.0E-04	Unequal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.857	0.563	0.1429	Normal Distribution							
PCB 170 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	2	0.94	0.178	1.7	0.94	0.88	1	0.06	9.03%	0.00%	
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	75.11%	
PCB 170 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	0.88	1	Outlier								
31243-105		0.24	0.24	0.23	0.23	0.23						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 12-2721-0564		Endpoint: PCB 180		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018									
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C > T	31243-101 passed pcb 180	74.41%									
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Pre-Test Tissue		31243-101	-0.0696	1.94	2.23	6	CDF	0.5266	Non-Significant Effect			
Auxiliary Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	1.94	2.13	0.1740	No Outliers Detected							
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.012	0.012	1	0.00485	0.9467	Non-Significant Effect						
Error	14.848	2.47467	6									
Total	14.86		7									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	7.08	199	0.2553	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.947	0.645	0.6808	Normal Distribution							
PCB 180 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%	
31243-101		5	3.08	0.768	5.39	3.2	1.2	5.9	0.833	60.45%	-2.67%	
PCB 180 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	2.5	2.7	3.8								
31243-101		1.2	5.9	1.6	3.5	3.2						

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 14-6166-5807		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 180				68.41%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.208	1.94	2.05	6	CDF	0.4209	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.11	2.13	0.0589	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.09075	0.09075	1	0.0434	0.8419	Non-Significant Effect					
Error	12.548	2.09133	6								
Total	12.6387		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.9	199	0.3002	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.882	0.645	0.1948	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-102		5	2.78	0.668	4.89	2.6	1.3	5.6	0.761	61.17%	7.33%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-102		5.6	2.8	1.3	2.6	1.6					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.					
Analysis ID: 18-6914-7352		Endpoint: PCB 180		CETIS Version: CETISv1.9.3								
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample			Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu						
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018									
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)									
Data Transform	Alt Hyp	Comparison Result	PMSD									
Untransformed	C > T	31243-103 passed pcb 180	96.11%									
Equal Variance t Two-Sample Test												
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)			
Pre-Test Tissue		31243-103	-0.189	1.94	2.88	6	CDF	0.5717	Non-Significant Effect			
Auxiliary Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)							
Extreme Value	Grubbs Extreme Value Test	2.19	2.13	0.0278	Outlier Detected							
ANOVA Table												
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)						
Between	0.147	0.147	1	0.0356	0.8565	Non-Significant Effect						
Error	24.768	4.128	6									
Total	24.915		7									
Distributional Tests												
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)							
Variances	Variance Ratio F Test	12.1	199	0.1551	Equal Variances							
Distribution	Shapiro-Wilk W Normality Test	0.831	0.645	0.0605	Normal Distribution							
PCB 180 Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%	
31243-103		5	3.28	0.252	6.31	2.1	1.6	7.4	1.09	74.35%	-9.33%	
PCB 180 Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
31250-PRE	PR	2.5	2.7	3.8								
31243-103		3.6	2.1	1.6	1.7	7.4						

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 06-5821-0785		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-103 passed pcb 180				43.23%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	1.17	2.02	1.3	5	CDF	0.1482	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.964286	0.964286	1	1.36	0.2964	Non-Significant Effect					
Error	3.55	0.71	5								
Total	4.51429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.75	199	0.7681	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.819	0.563	0.0622	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-103		4	2.25	0.777	3.72	1.9	1.6	3.6	0.463	41.14%	25.00%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-103		3.6	2.1	1.6	1.7	Outlier					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-9969-9122		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 180	52.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1.03	1.94	1.57	6	CDF	0.1709	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.5	2.13	0.8957	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.30417	1.30417	1	1.07	0.3418	Non-Significant Effect					
Error	7.34512	1.22419	6								
Total	8.64929		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.25	199	0.4981	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.95	0.645	0.7107	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-104		5	2.17	0.6	3.73	2.2	0.85	3.7	0.564	58.24%	27.80%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-104		3.7	2.2	0.98	0.85	3.1					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-1812-0907		Endpoint: PCB 180		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 failed pcb 180	29.23%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105*	3.91	1.94	0.877	6	CDF	0.0039	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.4	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	5.83443	5.83443	1	15.3	0.0079	Significant Effect					
Error	2.29072	0.381787	6								
Total	8.12515		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.5	26.3	0.6548	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.881	0.645	0.1931	Normal Distribution						
PCB 180 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	3	1.26	4.74	2.7	2.5	3.8	0.404	23.33%	0.00%
31243-105		5	1.24	0.525	1.95	1.4	0.64	1.9	0.256	46.31%	58.80%
PCB 180 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.5	2.7	3.8							
31243-105		0.64	0.64	1.4	1.6	1.9					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 15-1197-2026		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 183	66.85%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.423	1.94	0.604	6	CDF	0.3436	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.59	2.13	0.6779	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0323408	0.0323408	1	0.179	0.6873	Non-Significant Effect					
Error	1.08635	0.181058	6								
Total	1.11869		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	35.1	199	0.0558	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.937	0.645	0.5832	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-101		5	0.772	0.129	1.41	0.99	0.22	1.4	0.231	67.03%	14.54%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-101		0.22	1.4	0.25	1	0.99					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 09-7021-6501		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 183	64.04%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.125	1.94	0.579	6	CDF	0.4522	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.21	2.13	0.0227	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0026133	0.0026133	1	0.0157	0.9043	Non-Significant Effect					
Error	0.997187	0.166198	6								
Total	0.9998		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	32.2	199	0.0608	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.834	0.645	0.0650	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-102		5	0.866	0.251	1.48	0.76	0.44	1.7	0.222	57.21%	4.13%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-102		1.7	0.76	0.44	0.87	0.56					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-2654-0239		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 passed pcb 183	81.65%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-0.255	1.94	0.738	6	CDF	0.5963	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.29	2.13	0.0084	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0175208	0.0175208	1	0.0649	0.8075	Non-Significant Effect					
Error	1.62087	0.270144	6								
Total	1.63839		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	52.6	199	0.0375	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.769	0.645	0.0133	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-103		5	1	0.213	1.79	0.76	0.58	2.1	0.283	63.36%	-10.70%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-103		0.96	0.76	0.6	0.58	2.1					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 18-2675-3602		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 183	49.45%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1.22	1.94	0.447	6	CDF	0.1335	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.64	2.13	0.5863	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.148403	0.148403	1	1.5	0.2669	Non-Significant Effect					
Error	0.594547	0.0990911	6								
Total	0.74295		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	19	199	0.1014	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.947	0.645	0.6784	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-104		5	0.622	0.149	1.09	0.67	0.24	1.1	0.17	61.18%	31.14%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-104		1.1	0.67	0.24	0.24	0.86					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-5933-2442		Endpoint: PCB 183		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 failed pcb 183	21.94%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105*	4.8	1.94	0.198	6	CDF	0.0015	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.35	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.448963	0.448963	1	23	0.0030	Significant Effect					
Error	0.116987	0.0194978	6								
Total	0.56595		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	3.33	199	0.4879	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.853	0.645	0.1010	Normal Distribution						
PCB 183 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.903	0.686	1.12	0.88	0.83	1	0.0504	9.67%	0.00%
31243-105		5	0.414	0.216	0.612	0.51	0.24	0.55	0.0713	38.52%	54.17%
PCB 183 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.83	0.88	1							
31243-105		0.24	0.24	0.55	0.51	0.53					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-8062-8481		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 184	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-4383-4381		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 184				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-6745-6763		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 184	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-9734-7726		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 184	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-7214-7736		Endpoint: PCB 184		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-105 passed pcb 184				3.34%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 184 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 184 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-3346-2507		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-101 passed pcb 187				66.07%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.512	1.94	1.5	6	CDF	0.3134	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.87	2.13	0.2399	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.292053	0.292053	1	0.262	0.6269	Non-Significant Effect					
Error	6.68175	1.11362	6								
Total	6.9738		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.67	199	0.3684	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.928	0.645	0.4964	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-101		5	1.87	0.347	3.4	1.7	0.77	3.7	0.549	65.62%	17.41%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-101		0.77	3.7	0.79	2.4	1.7					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-1509-2227		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 187				62.30%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.455	1.94	1.41	6	CDF	0.3325	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.02	2.13	0.1054	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.205013	0.205013	1	0.207	0.6651	Non-Significant Effect					
Error	5.94059	0.990098	6								
Total	6.1456		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.09	199	0.4117	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.915	0.645	0.3930	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-102		5	1.94	0.508	3.36	1.9	0.88	3.8	0.514	59.42%	14.59%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-102		3.8	2	0.88	1.9	1.1					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-4593-6450		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-103 passed pcb 187				73.08%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103	-0.18	1.94	1.66	6	CDF	0.5684	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	2.2	2.13	0.0245	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0440834	0.0440834	1	0.0324	0.8632	Non-Significant Effect					
Error	8.17467	1.36244	6								
Total	8.21875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.82	199	0.3039	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.786	0.645	0.0204	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-103		5	2.42	0.717	4.12	1.7	1.6	4.8	0.614	56.69%	-6.76%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-103		2.4	1.7	1.6	1.6	4.8					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 05-8235-7475		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 187	52.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	1.38	1.94	1.18	6	CDF	0.1084	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.54	2.13	0.8047	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.3251	1.3251	1	1.91	0.2167	Non-Significant Effect					
Error	4.17299	0.695498	6								
Total	5.49809		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	2.73	199	0.5718	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.955	0.645	0.7624	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-104		5	1.43	0.26	2.59	1.6	0.24	2.4	0.42	65.84%	37.09%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-104		2.4	1.6	0.24	0.69	2.2					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-7418-0783		Endpoint: PCB 187		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 failed pcb 187	30.56%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105*	3.95	1.94	0.693	6	CDF	0.0038	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.4	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.71008	3.71008	1	15.6	0.0076	Significant Effect					
Error	1.42987	0.238311	6								
Total	5.13995		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.65	26.3	0.6000	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.945	0.645	0.6646	Normal Distribution						
PCB 187 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	2.27	0.854	3.68	2.1	1.8	2.9	0.328	25.09%	0.00%
31243-105		5	0.86	0.311	1.41	1.1	0.24	1.3	0.198	51.45%	62.06%
PCB 187 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	2.1	1.8	2.9							
31243-105		0.24	0.56	1.3	1.1	1.1					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 02-4488-6918		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 195	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 01-3457-4129		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-102 passed pcb 195			6.77%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	-0.105	2.02	0.016	5	CDF	0.5397	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.190E-06	1.190E-06	1	0.011	0.9206	Non-Significant Effect					
Error	0.0005417	0.0001083	5								
Total	0.0005429		6								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	4.75	199	0.3576	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.881	0.563	0.2294	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		4	0.237	0.217	0.258	0.24	0.22	0.25	0.00629	5.30%	-0.35%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		Outlier	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-6436-6607		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 195	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 20-2639-9419		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 195	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 11-6825-5763		Endpoint: PCB 195		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-105 passed pcb 195	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 195 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 195 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-1218-6888		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-101	Marine Sediment	New Haven Harbor 2018	Composite 2 (R',S')								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-101 passed pcb 206	7.21%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.8	2.13	0.3306	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8.333E-05	8.333E-05	1	0.577	0.4763	Non-Significant Effect					
Error	0.0008667	0.0001444	6								
Total	0.00095		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	6	199	0.2959	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.865	0.645	0.1341	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 19-7236-7314		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-102 passed pcb 206	6.87%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 08-8919-6924		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-103 failed pcb 206	3.34%								
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 03-5842-3134		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-104	Marine Sediment	New Haven Harbor 2018	Composite 5 (TB-1,-2)								
Data Transform	Alt Hyp	Comparison Result	PMSD								
Untransformed	C > T	31243-104 passed pcb 206	2.96%								
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.75	2.13	0.4021	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.67	26.3	0.5950	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.685	0.645	0.0015	Non-Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

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Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 16-9484-6159		Endpoint: PCB 206		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-105 passed pcb 206				3.34%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 206 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 206 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 10-1873-0411		Endpoint: PCB 209		CETIS Version: CETISv1.9.3			Official Results: Yes				
Analyzed: 22 Mar-19 14:07		Analysis: Parametric-Two Sample									
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-101	15-5297-8957	24 Oct-18 15:45	24 Oct-18 15:45	26d 20h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-101	Marine Sediment	New Haven Harbor 2018		Composite 2 (R',S')							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C > T		31243-101 passed pcb 209				7.21%				
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-101	0.76	1.94	0.017	6	CDF	0.2381	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:5%)				
Extreme Value	Grubbs Extreme Value Test			1.8	2.13	0.3306	No Outliers Detected				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between	8.333E-05		8.333E-05	1	0.577	0.4763	Non-Significant Effect				
Error	0.0008667		0.0001444	6							
Total	0.00095			7							
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Variance Ratio F Test			6	199	0.2959	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test			0.865	0.645	0.1341	Normal Distribution				
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-101		5	0.23	0.212	0.248	0.22	0.22	0.25	0.00632	6.15%	2.82%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-101		0.22	0.22	0.25	0.22	0.24					

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Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 13-1565-6816		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:08		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-102	14-6497-5144	25 Oct-18 20:30	25 Oct-18 20:30	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-102	Marine Sediment	New Haven Harbor 2018	Composite 3 (US-1,-2)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-102 passed pcb 209				6.87%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-102	0.319	1.94	0.016	6	CDF	0.3803	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.51	2.13	0.8673	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.102	0.7606	Non-Significant Effect					
Error	0.0007867	0.0001311	6								
Total	0.0008		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	5.4	199	0.3246	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.906	0.645	0.3264	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-102		5	0.234	0.217	0.251	0.24	0.22	0.25	0.006	5.73%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-102		0.22	0.24	0.22	0.25	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 114 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 00-2761-8212		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-103	11-7829-0787	25 Oct-18 20:00	25 Oct-18 20:00	25d 16h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-103	Marine Sediment	New Haven Harbor 2018	Composite 4 (DS-1,-2)								
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C > T	31243-103 failed pcb 209			3.34%						
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-103*	3.11	1.94	0.008	6	CDF	0.0104	Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.0003008	0.0003008	1	9.67	0.0209	Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0004875		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-103		5	0.224	0.217	0.231	0.22	0.22	0.23	0.00245	2.45%	5.35%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-103		0.22	0.23	0.22	0.23	0.22					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 115 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

Bioaccumulation Evaluation - PCB Congeners - Nereis										EnviroSystems, Inc.	
Analysis ID: 17-7582-9539		Endpoint: PCB 209			CETIS Version: CETISv1.9.3						
Analyzed: 22 Mar-19 14:10		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-104	19-8587-2932	25 Oct-18 11:10	25 Oct-18 11:10	26d 1h							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
31250-PRE	Pre-test Tissue	New Haven Harbor 2018		99NvARO112018							
31243-104	Marine Sediment	New Haven Harbor 2018		Composite 5 (TB-1,-2)							
Data Transform	Alt Hyp		Comparison Result				PMSD				
Untransformed	C > T		31243-104 passed pcb 209				2.96%				
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-104	23.5	n/a	3	6	Exact	0.6429	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:5%)					
Extreme Value	Grubbs Extreme Value Test		1.75	2.13	0.4021	No Outliers Detected					
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3.333E-06	3.333E-06	1	0.136	0.7246	Non-Significant Effect					
Error	0.0001467	2.444E-05	6								
Total	0.00015		7								
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F Test		1.67	26.3	0.5950	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.685	0.645	0.0015	Non-Normal Distribution					
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-104		5	0.238	0.232	0.244	0.24	0.23	0.24	0.002	1.88%	-0.56%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-104		0.24	0.23	0.24	0.24	0.24					

CETIS Analytical Report

Report Date: 22 Mar-19 14:15 (p 116 of 116)
Test Code: 31250Nv-PCB PRE | 09-6971-0849

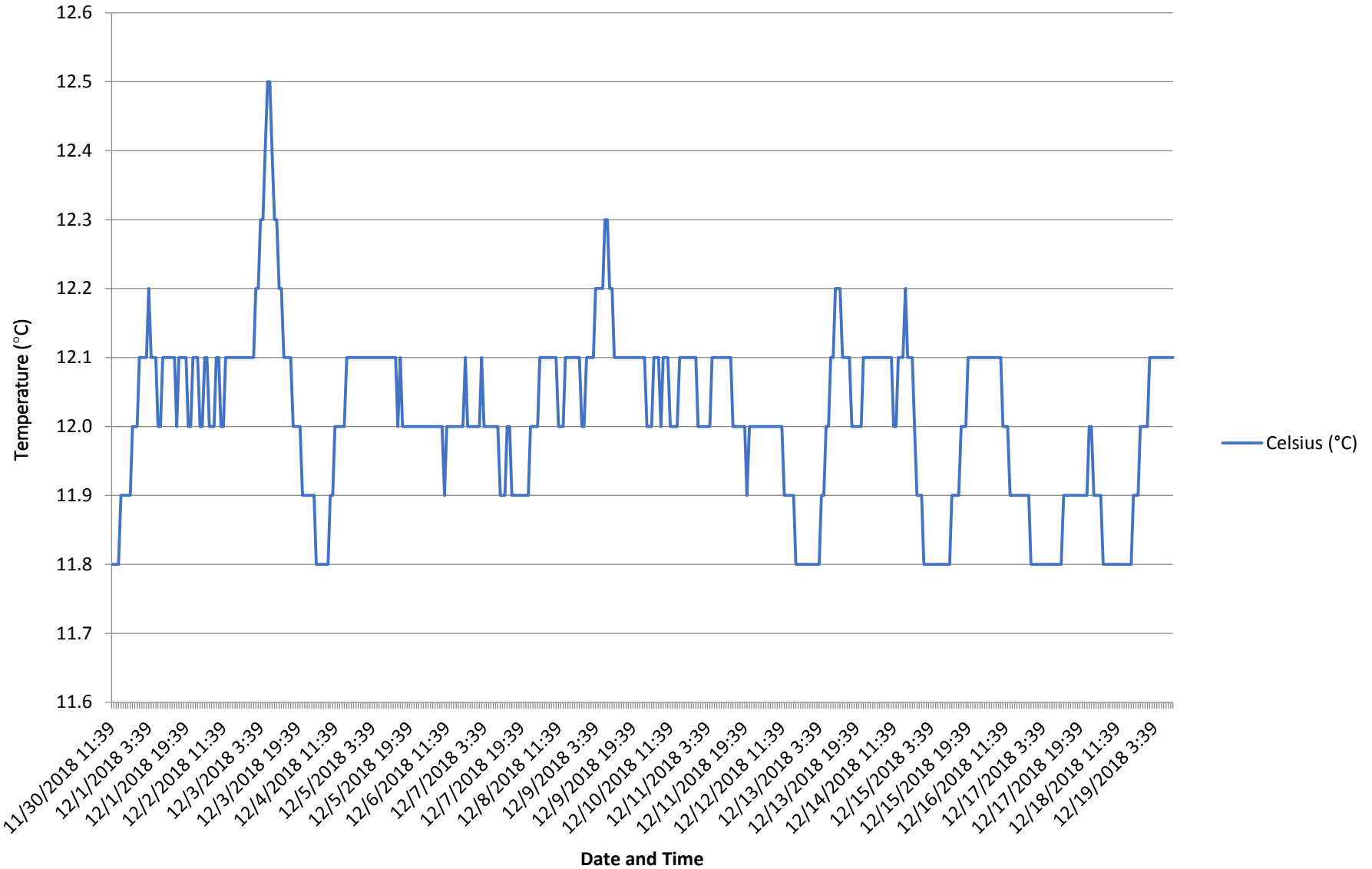
Bioaccumulation Evaluation - PCB Congeners - Nereis							EnviroSystems, Inc.				
Analysis ID: 07-5406-5358		Endpoint: PCB 209		CETIS Version: CETISv1.9.3							
Analyzed: 22 Mar-19 14:10		Analysis: Parametric-Two Sample		Official Results: Yes							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
31250-PRE	01-0823-8063	20 Nov-18	20 Nov-18	12h	AECOM	Dredged Sediment Evalu					
31243-105	20-6030-4038	24 Oct-18 11:15	24 Oct-18 11:15	27d 1h							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
31250-PRE	Pre-test Tissue	New Haven Harbor 2018	99NvARO112018								
31243-105	Marine Sediment	New Haven Harbor 2018	Composite 6 (CAD-1,-2,-3)								
Data Transform	Alt Hyp	Comparison Result				PMSD					
Untransformed	C > T	31243-105 passed pcb 209				3.34%					
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)		
Pre-Test Tissue		31243-105	0.655	1.94	0.008	6	CDF	0.2685	Non-Significant Effect		
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value Test	1.29	2.13	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.333E-05	1.333E-05	1	0.429	0.5370	Non-Significant Effect					
Error	0.0001867	3.111E-05	6								
Total	0.0002		7								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F Test	1.11	26.3	0.8265	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.84	0.645	0.0762	Normal Distribution						
PCB 209 Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
31250-PRE	PR	3	0.237	0.222	0.251	0.24	0.23	0.24	0.00333	2.44%	0.00%
31243-105		5	0.234	0.227	0.241	0.23	0.23	0.24	0.00245	2.34%	1.13%
PCB 209 Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
31250-PRE	PR	0.24	0.24	0.23							
31243-105		0.24	0.24	0.23	0.23	0.23					

M. nasuta and *N. virens*
28 day Bioaccumulation Evaluation

Hourly Temperature Data

31249 & 31250 - New Haven Harbor FNP 2018

M. nasuta and *N. virens* 28 day Bioaccumulation Evaluation



STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
1	11/30/2018 11:39	11.8
2	11/30/2018 12:39	11.8
3	11/30/2018 13:39	11.8
4	11/30/2018 14:39	11.8
5	11/30/2018 15:39	11.9
6	11/30/2018 16:39	11.9
7	11/30/2018 17:39	11.9
8	11/30/2018 18:39	11.9
9	11/30/2018 19:39	11.9
10	11/30/2018 20:39	12.0
11	11/30/2018 21:39	12.0
12	11/30/2018 22:39	12.0
13	11/30/2018 23:39	12.1
14	12/1/2018 0:39	12.1
15	12/1/2018 1:39	12.1
16	12/1/2018 2:39	12.1
17	12/1/2018 3:39	12.2
18	12/1/2018 4:39	12.1
19	12/1/2018 5:39	12.1
20	12/1/2018 6:39	12.1
21	12/1/2018 7:39	12.0
22	12/1/2018 8:39	12.0
23	12/1/2018 9:39	12.1
24	12/1/2018 10:39	12.1
25	12/1/2018 11:39	12.1
26	12/1/2018 12:39	12.1
27	12/1/2018 13:39	12.1
28	12/1/2018 14:39	12.1
29	12/1/2018 15:39	12.0
30	12/1/2018 16:39	12.1
31	12/1/2018 17:39	12.1
32	12/1/2018 18:39	12.1
33	12/1/2018 19:39	12.1
34	12/1/2018 20:39	12.0
35	12/1/2018 21:39	12.0

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
36	12/1/2018 22:39	12.1
37	12/1/2018 23:39	12.1
38	12/2/2018 0:39	12.1
39	12/2/2018 1:39	12.0
40	12/2/2018 2:39	12.0
41	12/2/2018 3:39	12.1
42	12/2/2018 4:39	12.1
43	12/2/2018 5:39	12.0
44	12/2/2018 6:39	12.0
45	12/2/2018 7:39	12.0
46	12/2/2018 8:39	12.1
47	12/2/2018 9:39	12.1
48	12/2/2018 10:39	12.0
49	12/2/2018 11:39	12.0
50	12/2/2018 12:39	12.1
51	12/2/2018 13:39	12.1
52	12/2/2018 14:39	12.1
53	12/2/2018 15:39	12.1
54	12/2/2018 16:39	12.1
55	12/2/2018 17:39	12.1
56	12/2/2018 18:39	12.1
57	12/2/2018 19:39	12.1
58	12/2/2018 20:39	12.1
59	12/2/2018 21:39	12.1
60	12/2/2018 22:39	12.1
61	12/2/2018 23:39	12.1
62	12/3/2018 0:39	12.1
63	12/3/2018 1:39	12.2
64	12/3/2018 2:39	12.2
65	12/3/2018 3:39	12.3
66	12/3/2018 4:39	12.3
67	12/3/2018 5:39	12.4
68	12/3/2018 6:39	12.5
69	12/3/2018 7:39	12.5
70	12/3/2018 8:39	12.4

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
71	12/3/2018 9:39	12.3
72	12/3/2018 10:39	12.3
73	12/3/2018 11:39	12.2
74	12/3/2018 12:39	12.2
75	12/3/2018 13:39	12.1
76	12/3/2018 14:39	12.1
77	12/3/2018 15:39	12.1
78	12/3/2018 16:39	12.1
79	12/3/2018 17:39	12.0
80	12/3/2018 18:39	12.0
81	12/3/2018 19:39	12.0
82	12/3/2018 20:39	12.0
83	12/3/2018 21:39	11.9
84	12/3/2018 22:39	11.9
85	12/3/2018 23:39	11.9
86	12/4/2018 0:39	11.9
87	12/4/2018 1:39	11.9
88	12/4/2018 2:39	11.9
89	12/4/2018 3:39	11.8
90	12/4/2018 4:39	11.8
91	12/4/2018 5:39	11.8
92	12/4/2018 6:39	11.8
93	12/4/2018 7:39	11.8
94	12/4/2018 8:39	11.8
95	12/4/2018 9:39	11.9
96	12/4/2018 10:39	11.9
97	12/4/2018 11:39	12.0
98	12/4/2018 12:39	12.0
99	12/4/2018 13:39	12.0
100	12/4/2018 14:39	12.0
101	12/4/2018 15:39	12.0
102	12/4/2018 16:39	12.1
103	12/4/2018 17:39	12.1
104	12/4/2018 18:39	12.1
105	12/4/2018 19:39	12.1

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
106	12/4/2018 20:39	12.1
107	12/4/2018 21:39	12.1
108	12/4/2018 22:39	12.1
109	12/4/2018 23:39	12.1
110	12/5/2018 0:39	12.1
111	12/5/2018 1:39	12.1
112	12/5/2018 2:39	12.1
113	12/5/2018 3:39	12.1
114	12/5/2018 4:39	12.1
115	12/5/2018 5:39	12.1
116	12/5/2018 6:39	12.1
117	12/5/2018 7:39	12.1
118	12/5/2018 8:39	12.1
119	12/5/2018 9:39	12.1
120	12/5/2018 10:39	12.1
121	12/5/2018 11:39	12.1
122	12/5/2018 12:39	12.1
123	12/5/2018 13:39	12.1
124	12/5/2018 14:39	12.0
125	12/5/2018 15:39	12.1
126	12/5/2018 16:39	12.0
127	12/5/2018 17:39	12.0
128	12/5/2018 18:39	12.0
129	12/5/2018 19:39	12.0
130	12/5/2018 20:39	12.0
131	12/5/2018 21:39	12.0
132	12/5/2018 22:39	12.0
133	12/5/2018 23:39	12.0
134	12/6/2018 0:39	12.0
135	12/6/2018 1:39	12.0
136	12/6/2018 2:39	12.0
137	12/6/2018 3:39	12.0
138	12/6/2018 4:39	12.0
139	12/6/2018 5:39	12.0
140	12/6/2018 6:39	12.0

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
141	12/6/2018 7:39	12.0
142	12/6/2018 8:39	12.0
143	12/6/2018 9:39	12.0
144	12/6/2018 10:39	11.9
145	12/6/2018 11:39	12.0
146	12/6/2018 12:39	12.0
147	12/6/2018 13:39	12.0
148	12/6/2018 14:39	12.0
149	12/6/2018 15:39	12.0
150	12/6/2018 16:39	12.0
151	12/6/2018 17:39	12.0
152	12/6/2018 18:39	12.0
153	12/6/2018 19:39	12.1
154	12/6/2018 20:39	12.0
155	12/6/2018 21:39	12.0
156	12/6/2018 22:39	12.0
157	12/6/2018 23:39	12.0
158	12/7/2018 0:39	12.0
159	12/7/2018 1:39	12.0
160	12/7/2018 2:39	12.1
161	12/7/2018 3:39	12.0
162	12/7/2018 4:39	12.0
163	12/7/2018 5:39	12.0
164	12/7/2018 6:39	12.0
165	12/7/2018 7:39	12.0
166	12/7/2018 8:39	12.0
167	12/7/2018 9:39	12.0
168	12/7/2018 10:39	11.9
169	12/7/2018 11:39	11.9
170	12/7/2018 12:39	11.9
171	12/7/2018 13:39	12.0
172	12/7/2018 14:39	12.0
173	12/7/2018 15:39	11.9
174	12/7/2018 16:39	11.9
175	12/7/2018 17:39	11.9

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
176	12/7/2018 18:39	11.9
177	12/7/2018 19:39	11.9
178	12/7/2018 20:39	11.9
179	12/7/2018 21:39	11.9
180	12/7/2018 22:39	11.9
181	12/7/2018 23:39	12.0
182	12/8/2018 0:39	12.0
183	12/8/2018 1:39	12.0
184	12/8/2018 2:39	12.0
185	12/8/2018 3:39	12.1
186	12/8/2018 4:39	12.1
187	12/8/2018 5:39	12.1
188	12/8/2018 6:39	12.1
189	12/8/2018 7:39	12.1
190	12/8/2018 8:39	12.1
191	12/8/2018 9:39	12.1
192	12/8/2018 10:39	12.1
193	12/8/2018 11:39	12.0
194	12/8/2018 12:39	12.0
195	12/8/2018 13:39	12.0
196	12/8/2018 14:39	12.1
197	12/8/2018 15:39	12.1
198	12/8/2018 16:39	12.1
199	12/8/2018 17:39	12.1
200	12/8/2018 18:39	12.1
201	12/8/2018 19:39	12.1
202	12/8/2018 20:39	12.1
203	12/8/2018 21:39	12.0
204	12/8/2018 22:39	12.0
205	12/8/2018 23:39	12.1
206	12/9/2018 0:39	12.1
207	12/9/2018 1:39	12.1
208	12/9/2018 2:39	12.1
209	12/9/2018 3:39	12.2
210	12/9/2018 4:39	12.2

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
211	12/9/2018 5:39	12.2
212	12/9/2018 6:39	12.2
213	12/9/2018 7:39	12.3
214	12/9/2018 8:39	12.3
215	12/9/2018 9:39	12.2
216	12/9/2018 10:39	12.2
217	12/9/2018 11:39	12.1
218	12/9/2018 12:39	12.1
219	12/9/2018 13:39	12.1
220	12/9/2018 14:39	12.1
221	12/9/2018 15:39	12.1
222	12/9/2018 16:39	12.1
223	12/9/2018 17:39	12.1
224	12/9/2018 18:39	12.1
225	12/9/2018 19:39	12.1
226	12/9/2018 20:39	12.1
227	12/9/2018 21:39	12.1
228	12/9/2018 22:39	12.1
229	12/9/2018 23:39	12.1
230	12/10/2018 0:39	12.1
231	12/10/2018 1:39	12.0
232	12/10/2018 2:39	12.0
233	12/10/2018 3:39	12.0
234	12/10/2018 4:39	12.1
235	12/10/2018 5:39	12.1
236	12/10/2018 6:39	12.1
237	12/10/2018 7:39	12.0
238	12/10/2018 8:39	12.1
239	12/10/2018 9:39	12.1
240	12/10/2018 10:39	12.1
241	12/10/2018 11:39	12.0
242	12/10/2018 12:39	12.0
243	12/10/2018 13:39	12.0
244	12/10/2018 14:39	12.0
245	12/10/2018 15:39	12.1

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
246	12/10/2018 16:39	12.1
247	12/10/2018 17:39	12.1
248	12/10/2018 18:39	12.1
249	12/10/2018 19:39	12.1
250	12/10/2018 20:39	12.1
251	12/10/2018 21:39	12.1
252	12/10/2018 22:39	12.1
253	12/10/2018 23:39	12.0
254	12/11/2018 0:39	12.0
255	12/11/2018 1:39	12.0
256	12/11/2018 2:39	12.0
257	12/11/2018 3:39	12.0
258	12/11/2018 4:39	12.0
259	12/11/2018 5:39	12.1
260	12/11/2018 6:39	12.1
261	12/11/2018 7:39	12.1
262	12/11/2018 8:39	12.1
263	12/11/2018 9:39	12.1
264	12/11/2018 10:39	12.1
265	12/11/2018 11:39	12.1
266	12/11/2018 12:39	12.1
267	12/11/2018 13:39	12.1
268	12/11/2018 14:39	12.0
269	12/11/2018 15:39	12.0
270	12/11/2018 16:39	12.0
271	12/11/2018 17:39	12.0
272	12/11/2018 18:39	12.0
273	12/11/2018 19:39	12.0
274	12/11/2018 20:39	11.9
275	12/11/2018 21:39	12.0
276	12/11/2018 22:39	12.0
277	12/11/2018 23:39	12.0
278	12/12/2018 0:39	12.0
279	12/12/2018 1:39	12.0
280	12/12/2018 2:39	12.0

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
281	12/12/2018 3:39	12.0
282	12/12/2018 4:39	12.0
283	12/12/2018 5:39	12.0
284	12/12/2018 6:39	12.0
285	12/12/2018 7:39	12.0
286	12/12/2018 8:39	12.0
287	12/12/2018 9:39	12.0
288	12/12/2018 10:39	12.0
289	12/12/2018 11:39	12.0
290	12/12/2018 12:39	11.9
291	12/12/2018 13:39	11.9
292	12/12/2018 14:39	11.9
293	12/12/2018 15:39	11.9
294	12/12/2018 16:39	11.9
295	12/12/2018 17:39	11.8
296	12/12/2018 18:39	11.8
297	12/12/2018 19:39	11.8
298	12/12/2018 20:39	11.8
299	12/12/2018 21:39	11.8
300	12/12/2018 22:39	11.8
301	12/12/2018 23:39	11.8
302	12/13/2018 0:39	11.8
303	12/13/2018 1:39	11.8
304	12/13/2018 2:39	11.8
305	12/13/2018 3:39	11.8
306	12/13/2018 4:39	11.9
307	12/13/2018 5:39	11.9
308	12/13/2018 6:39	12.0
309	12/13/2018 7:39	12.0
310	12/13/2018 8:39	12.1
311	12/13/2018 9:39	12.1
312	12/13/2018 10:39	12.2
313	12/13/2018 11:39	12.2
314	12/13/2018 12:39	12.2
315	12/13/2018 13:39	12.1

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CLIENT: AECOM
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TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
316	12/13/2018 14:39	12.1
317	12/13/2018 15:39	12.1
318	12/13/2018 16:39	12.1
319	12/13/2018 17:39	12.0
320	12/13/2018 18:39	12.0
321	12/13/2018 19:39	12.0
322	12/13/2018 20:39	12.0
323	12/13/2018 21:39	12.0
324	12/13/2018 22:39	12.1
325	12/13/2018 23:39	12.1
326	12/14/2018 0:39	12.1
327	12/14/2018 1:39	12.1
328	12/14/2018 2:39	12.1
329	12/14/2018 3:39	12.1
330	12/14/2018 4:39	12.1
331	12/14/2018 5:39	12.1
332	12/14/2018 6:39	12.1
333	12/14/2018 7:39	12.1
334	12/14/2018 8:39	12.1
335	12/14/2018 9:39	12.1
336	12/14/2018 10:39	12.1
337	12/14/2018 11:39	12.0
338	12/14/2018 12:39	12.0
339	12/14/2018 13:39	12.1
340	12/14/2018 14:39	12.1
341	12/14/2018 15:39	12.1
342	12/14/2018 16:39	12.2
343	12/14/2018 17:39	12.1
344	12/14/2018 18:39	12.1
345	12/14/2018 19:39	12.1
346	12/14/2018 20:39	12.0
347	12/14/2018 21:39	11.9
348	12/14/2018 22:39	11.9
349	12/14/2018 23:39	11.9
350	12/15/2018 0:39	11.8

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
351	12/15/2018 1:39	11.8
352	12/15/2018 2:39	11.8
353	12/15/2018 3:39	11.8
354	12/15/2018 4:39	11.8
355	12/15/2018 5:39	11.8
356	12/15/2018 6:39	11.8
357	12/15/2018 7:39	11.8
358	12/15/2018 8:39	11.8
359	12/15/2018 9:39	11.8
360	12/15/2018 10:39	11.8
361	12/15/2018 11:39	11.8
362	12/15/2018 12:39	11.9
363	12/15/2018 13:39	11.9
364	12/15/2018 14:39	11.9
365	12/15/2018 15:39	11.9
366	12/15/2018 16:39	12.0
367	12/15/2018 17:39	12.0
368	12/15/2018 18:39	12.0
369	12/15/2018 19:39	12.1
370	12/15/2018 20:39	12.1
371	12/15/2018 21:39	12.1
372	12/15/2018 22:39	12.1
373	12/15/2018 23:39	12.1
374	12/16/2018 0:39	12.1
375	12/16/2018 1:39	12.1
376	12/16/2018 2:39	12.1
377	12/16/2018 3:39	12.1
378	12/16/2018 4:39	12.1
379	12/16/2018 5:39	12.1
380	12/16/2018 6:39	12.1
381	12/16/2018 7:39	12.1
382	12/16/2018 8:39	12.1
383	12/16/2018 9:39	12.1
384	12/16/2018 10:39	12.0
385	12/16/2018 11:39	12.0

STUDY: 31249 & 31250
CLIENT: AECOM
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ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
386	12/16/2018 12:39	12.0
387	12/16/2018 13:39	11.9
388	12/16/2018 14:39	11.9
389	12/16/2018 15:39	11.9
390	12/16/2018 16:39	11.9
391	12/16/2018 17:39	11.9
392	12/16/2018 18:39	11.9
393	12/16/2018 19:39	11.9
394	12/16/2018 20:39	11.9
395	12/16/2018 21:39	11.9
396	12/16/2018 22:39	11.8
397	12/16/2018 23:39	11.8
398	12/17/2018 0:39	11.8
399	12/17/2018 1:39	11.8
400	12/17/2018 2:39	11.8
401	12/17/2018 3:39	11.8
402	12/17/2018 4:39	11.8
403	12/17/2018 5:39	11.8
404	12/17/2018 6:39	11.8
405	12/17/2018 7:39	11.8
406	12/17/2018 8:39	11.8
407	12/17/2018 9:39	11.8
408	12/17/2018 10:39	11.8
409	12/17/2018 11:39	11.8
410	12/17/2018 12:39	11.9
411	12/17/2018 13:39	11.9
412	12/17/2018 14:39	11.9
413	12/17/2018 15:39	11.9
414	12/17/2018 16:39	11.9
415	12/17/2018 17:39	11.9
416	12/17/2018 18:39	11.9
417	12/17/2018 19:39	11.9
418	12/17/2018 20:39	11.9
419	12/17/2018 21:39	11.9
420	12/17/2018 22:39	11.9

STUDY: 31249 & 31250
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ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
421	12/17/2018 23:39	12.0
422	12/18/2018 0:39	12.0
423	12/18/2018 1:39	11.9
424	12/18/2018 2:39	11.9
425	12/18/2018 3:39	11.9
426	12/18/2018 4:39	11.9
427	12/18/2018 5:39	11.8
428	12/18/2018 6:39	11.8
429	12/18/2018 7:39	11.8
430	12/18/2018 8:39	11.8
431	12/18/2018 9:39	11.8
432	12/18/2018 10:39	11.8
433	12/18/2018 11:39	11.8
434	12/18/2018 12:39	11.8
435	12/18/2018 13:39	11.8
436	12/18/2018 14:39	11.8
437	12/18/2018 15:39	11.8
438	12/18/2018 16:39	11.8
439	12/18/2018 17:39	11.8
440	12/18/2018 18:39	11.9
441	12/18/2018 19:39	11.9
442	12/18/2018 20:39	11.9
443	12/18/2018 21:39	12
444	12/18/2018 22:39	12
445	12/18/2018 23:39	12
446	12/19/2018 0:39	12
447	12/19/2018 1:39	12.1
448	12/19/2018 2:39	12.1
449	12/19/2018 3:39	12.1
450	12/19/2018 4:39	12.1
451	12/19/2018 5:39	12.1
452	12/19/2018 6:39	12.1
453	12/19/2018 7:39	12.1
454	12/19/2018 8:39	12.1
455	12/19/2018 9:39	12.1

STUDY: 31249 & 31250
CLIENT: AECOM
PROJECT: New Haven Harbor FNP 2018
ASSAY: *M. nasuta* & *N. virens* 28 Day Bioaccumulation Evaluation
TASK: Hourly Temperature Data
Serial Number: Telatemp 10015918

Mean: 12.0 °C
Minimum: 11.8 °C
Maximum: 12.5 °C

Reading	Date and Time	Celsius (°C)
456	12/19/2018 10:39	12.1
457	12/19/2018 11:39	12.1

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	NA
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes, except as noted for PCBs in Section 2.4 and 3.3, and in Table 10. The complete tissue chemistry report is provided by Alpha Analytical under separate cover.
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	NA
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	NA
15. Were the SRM/CRM analyses within acceptance criteria?	NA
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	NA
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	NA
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	NA
19. Were surrogate recoveries within the required acceptance criteria?	NA
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	Yes, except as noted for temperature and salinity.
22. Were the test-specific age requirements met for each test species?	Yes
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	Yes
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	Yes
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	Yes

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species	No	Temperature (Sections 3.2.2, 3.3, Table 4, and Appendix A) and salinity (Sections 3.1.2, 3.2.2, 3.3, Table 4 and Appendix A) fell below the protocol ranges.	Data Package
Test species age	Age/health within guidelines for each species (Appendix V)	Yes		Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No	Yes		Data Package (separate cover)
Water column toxicity test: Control mortality Control abnormality	≤ 10% mean ≤ 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae	NA		
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	≤ 10% mean (no chamber > 20%) See EPA (1994a) Section 9; Table 11.3	Yes		Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

ASSAY REVIEW CHECKLIST

STUDY#: 31249 & 31250

CLIENT: AECOM

PROJECT: New Haven Harbor FNP 2018

ASSAY: *M. nasuta* & *N. virens* 28 day Bioaccumulation Evaluation

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	11/16/18	JTP	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)	01/17/19	TBG	
Bench Sheets Complete (dates, times, initials, etc...)	↓	↓	
Water Quality Data Complete	↓	↓	
Weights Reported	↓	NA	
Assay Acceptability Review	↓	TBG	

Technical Report Review	Date	Initials	Comments
Statistical Analysis <i>Data Entry (chem)</i>	2/11/19	NR	
Survival	12/27/18	NR	
Chemical	2/11/19	NR	
Statistical Analysis Reviewed	2/16/19	LF	
Data Acceptability Review	12/27/18	NR	
Support Documentation			
Temperature Data Logger	1/9/19	NR	
Daily WQ Data	1/10/19	NR	
Overlying and/or Pore Water Chemistry	NA		
Other Chemical Analysis Data	-		Tissue chemistry by Alpha Analytical
Draft Report	2/14/19	NR	3/8/19 provided by AECOM 1/30/19
Report Reviewed	2/18/19	LF	1/9/19 revised per AECOM comments (NR) 2/14/19 Draft Final by LF
QA Audit/Review Complete			QC Sec. 2.5+ 3.0 + CE (NR) 3/8/19 (NR) full review per AECOM comment
Report Printed - PDF	2/22/19	NR	3/8/19 (NR) draft final 4/10/19
<i>Bioaccumulation EDD</i>	2/13/19	NR	QC 2/12/19 LF
Report E-mailed / Faxed	2/22/19	NR	3/8/19 (NR) draft final
Report Logged Out	↓	↓	4/10/19 Diff. Final w/ supp. PCB eval

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