United States Army Corps of Engineers
New England District

2023 Annual Operations, Maintenance, and Monitoring Report

Main Post
Former Fort Devens Army Installation
Devens, Massachusetts

Contract No. W912WJ-19-D-0014

Contract Delivery Order No. W912WJ-23-F-0055

July 2024

2023 Annual Operations, Maintenance, and Monitoring Report

Main Post
Former Fort Devens Army Installation
Devens, Massachusetts

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CERTIFICATION

I hereby certify that the enclosed Report, shown and marked in this submittal, is that proposed to be incorporated with Contract Number W912WJ-19-D-0014. This document was prepared in accordance with the United States Army Corps of Engineers (USACE) Scope of Work and is hereby submitted for Government approval.

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The United States Department of Defense, Department of Army, funded wholly or in part the preparation of this document and work described herein under Contract No. W912WJ-19-D-0014. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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Acronyms and Abbreviations

µg/L	microgram per liter
AAFES	Army Air Force Exchange Service
AOC	area of contamination
Army	United States Army
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCV	continuing calibration verification
CFS	Commonwealth Fusion Systems
CG	cleanup goal
COC	contaminant of concern
COD	chemical oxygen demand
CSM	conceptual site model
DCB	dichlorobenzene
DCL	Fort Devens Consolidation Landfill
DO	dissolved oxygen
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPH	extractable petroleum hydrocarbon
ESMA	Excavated Soils Management Area
Eurofins	Eurofins TestAmerica Laboratories, Inc.
Fort Devens	former Fort Devens Army Installation
FS	feasibility study
ft/ft	foot per foot
HA	Housing Area
Harding	Harding Environmental Science & Engineering, Inc.
HGL	HydroGeoLogic, Inc.
HLA	Harding Lawson Associates, Inc.
Horne	Horne Engineering Services, Inc.
J	estimated concentration
KGS	KOMAN Government Solutions, LLC
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LDC	Laboratory Data Consultants, Inc.
LTM	long-term monitoring

LTM Plan	Long-Term Monitoring Plan
LTMMP	Long-Term Monitoring and Maintenance Plan
LTM Report	2022 Annual Long-Term Monitoring Report
LUC	land-use control
LUCIP	Land-Use Control Implementation Plan
LUCIP Addendum	Land-Use Control Implementation Plan Addendum
MassDEP	Massachusetts Department of Environmental Protection
MassDevelopment	Massachusetts Development and Finance Agency
MCL	maximum contaminant level
MEC	munitions and explosives of concern
mg/L	milligram per liter
mm	millimeter
MNA	monitored natural attenuation
MPE	measuring point elevation
MS	matrix spike
MSD	matrix spike duplicate
mV	millivolt
NAUL	Notice of Activity and Use Limitation
NAVD88	North American Vertical Datum of 1988
ORP	oxidation-reduction potential
RTN	Release Tracking Number
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QAPP	Quality Assurance Project Plan for the Annual Long-Term Monitoring and Maintenance Program
QC	quality control
RI	remedial investigation
ROD	Record of Decision
SA	Study Area
S-A JV	SERES-Arcadis 8(a) Joint Venture 2, LLC
SVOC	semivolatile organic compound
TDS	total dissolved solids
UJ/J	estimated
USAEC	United States Army Environmental Command
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons
Weston	Weston Solutions, Inc.
yd^3	cubic yard

1 Introduction

This 2023 Annual Long-Term Monitoring Report (LTM Report) details the performance of ongoing long-term monitoring (LTM) activities at the former Fort Devens Army Installation (Fort Devens) Main Post, located in Devens, Massachusetts (Figure 1). LTM activities were performed in accordance with the Long-Term Monitoring and Maintenance Plan (LTMMP; Sovereign/HydroGeoLogic, Inc. [HGL] 2015) and the Quality Assurance Project Plan for the Annual Long-Term Monitoring and Maintenance Program (QAPP; SERES-Arcadis 8(a) Joint Venture 2, LLC [S-A JV] 2020. S-A JV prepared this LTM Report on behalf of the United States Army Corps of Engineers (USACE) – New England District, under Contract Number W912WJ-19-D-0014.

1.1 Long-Term Monitoring Program Background

The LTM program instituted at Fort Devens is a result of the individual Records of Decision (RODs) issued for each area of contamination (AOC) and study area (SA) discussed in this LTM Report. These AOCs consist of:

- AOC 57: Building 3713 Fuel Oil Spill:
  - 2001 ROD by Harding Environmental Science & Engineering, Inc. (Harding [2001])
- AOC 69W: Fort Devens Elementary School (Building 215) Fuel Oil Spill Site:
  - 1999 ROD by Harding Lawson Associates, Inc. (HLA [1999a])
- AOC 43G: Historical Gas Station G:
  - 1996 ROD by United States Environmental Protection Agency (USEPA [1996])
- AOCs 32 and 43A: Defense Reutilization and Marketing Office Yard and former Petroleum, Oils, and Lubricants Storage Area:
  - 1998 ROD by Horne Engineering Services, Inc. (Horne [1998])
- The Fort Devens Consolidation Landfill (DCL):
  - 1999 ROD by HLA (HLA 1999b)
- Grant Housing Area (HA) and 37-millimeter (mm) Impact Area:
  - 2009 ROD by Weston Solutions, Inc. (Weston [2009])
- AOC 44-52: Barnum Road Maintenance Yards
  - 1995 ROD by United States Army Environmental Center (USAEC [1995])
- SA 71: Former Railroad Round House
  - 2015 ROD by Sovereign Consulting, Inc. (Sovereign [2015])

The RODs established site-specific remedial actions for each AOC and SA, as well as the LTM program and land-use controls (LUCs). The effectiveness of the remedial actions is reviewed periodically in Five-Year Review Reports (HLA 2000; Nobis Engineering, Inc. 2005; HGL 2010; H&S Environmental, Inc. 2015; KOMAN Government Solutions, LLC [KGS] 2021).

LTM activities in 2023 were conducted at each of the above AOCs in accordance with the LTMMP (Sovereign/ HGL 2015) and included the following:

- *AOC 57*. Annual water level measurements at 19 locations at Areas 2 and 3, and groundwater sampling at Area 3, were conducted during the spring LTM event. Groundwater samples were analyzed for total metals (arsenic, iron, and manganese) at two Area 3 monitoring wells. One surface water location was also sampled

during the spring 2023 LTM event and the samples were analyzed for dissolved metals (arsenic, iron, and manganese). Additional water level gauging, groundwater sampling, and surface water sampling work was completed in 2023 as part of a Post-Record of Decision Supplemental Remedial Investigation Work Plan (Post-ROD SRI Work Plan), approved by the USEPA and submitted in June 2023 (S-A JV, 2023a). The results of the SRI will be discussed in the Post-ROD SRI Report, scheduled for submittal in 2024.

- *AOC 69W.* Annual water level measurements at 17 locations and groundwater sampling at eight monitoring wells and two well points were conducted during the fall LTM event. Samples from eight wells were analyzed for extractable petroleum hydrocarbons (EPHs) and target analyte polycyclic aromatic hydrocarbons (PAHs). Samples from each of the eight monitoring wells and two well points were also analyzed for dissolved metals (arsenic, iron, and/or manganese). Additional monitoring well installation, water level gauging, and groundwater sampling work was completed in 2023 as part of a Post-Record of Decision Supplemental Remedial Investigation Work Plan (Post-ROD SRI Work Plan), approved by the USEPA and submitted in June 2023 (S-A JV, 2023b). The results of the SRI will be discussed in the Post-ROD SRI Report, scheduled for submittal in 2024.
- *AOC 43G.* Annual water level measurements at 11 monitoring wells and groundwater sampling at five wells were conducted during the fall LTM event. Groundwater samples were analyzed for volatile petroleum hydrocarbons (VPHs); including target analytes: benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene; alkalinity; and total metals (iron and/or manganese). Additional monitoring well installation, water level gauging, and groundwater sampling work was completed in 2023, as part of a Post-Record of Decision Supplemental Remedial Investigation Work Plan (Post-ROD SRI Work Plan) approved by the USEPA and submitted in June 2023 (S-A JV, 2023c). The results of the SRI will be discussed in the Post-ROD SRI Report, scheduled for submittal in 2024.
- *AOC 32/43A.* Annual water level measurements at 26 locations and groundwater sampling at four monitoring wells were conducted during the spring LTM event. One well location was observed to be dry (well 32M-01-11XBR). Groundwater samples were analyzed for volatile organic compounds (VOCs), VPHs including target analytes BTEX/naphthalene, and total metals (arsenic and manganese).
- *DCL.* Annual landfill gas vent monitoring, monthly operation and maintenance of the leachate pump station, annual sampling of the leachate, and an annual landfill cap inspection were conducted. The DCL leachate sampling consists of collecting one sample and analyzing the sample for VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), total petroleum hydrocarbons, total metals (select list), total suspended solids, pH, total phenolics, and total cyanide. Semiannual water level measurements at seven locations, and semiannual groundwater sampling at four locations were conducted during the spring and fall LTM events. Groundwater samples were analyzed for VPHs including target analytes BTEX/naphthalene, EPHs including target PAHs, pesticides, total metals (select list), total dissolved solids (TDS), anions (chloride and sulfate), nitrate and nitrite, alkalinity, total cyanide, and chemical oxygen demand (COD).
- *Grant HA and 37 mm Impact Area*. Annual screening for unexploded ordnance (UXO) in the 37 mm Impact Area, performed by sweeping 10% of the site with a metal detector.

In addition to the above activities, annual LUC inspections and interviews were conducted at each of the above AOCs. LUC inspections and interview were also conducted at AOC 44-52 and SA 71 in accordance with LUCIPs prepared in 2023 (S-A JV, 2023d; S-A JV, 2023e). LUC inspections and interviews were also conducted at the former Oak and Maple HAs, as discussed in Section 7.2.

1.2 Site Description and History

The former Fort Devens Army Installation is located in the towns of Ayer and Shirley in Middlesex County, and Harvard and Lancaster in Worcester County, Massachusetts, approximately 35 miles northwest of Boston, Massachusetts. The installation occupied approximately 9,260 acres and was composed of the North, Main, and South Posts (Figure 1). Route 2 divides the South Post from the Main and North Posts. The Nashua River runs through the North, Main, and South Posts. The area surrounding Fort Devens is largely residential.

The area around Fort Devens was occupied by residential homes and farmland until 1917, when Camp Devens was established as a temporary training area for soldiers during World War I and was used for a variety of training missions until 1990. In 1932, the site was named Fort Devens and made a permanent installation with the primary mission of commanding, training, and providing logistical support for non-divisional troop units. The installation also supported the United States Army (Army) Readiness Regional and National Guard units in the New England area. Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986, Fort Devens was placed on the National Priorities List on November 21, 1989, because of identified environmental contamination at several sites.

Devens was identified for cessation of operations and closure under Public Law 101-510, the Defense Base Realignment and Closure (BRAC) Act of 1990, and officially closed in March 1996. As part of the Fort Devens BRAC program, portions of the property formerly occupied by Fort Devens were retained by the Army for reserve forces training and renamed the Devens Reserve Forces Training Area. Areas not retained as part of the Devens Reserve Forces Training Area have been either transferred or are in the process of being transferred to the Massachusetts Development and Finance Agency (MassDevelopment) for reuse and redevelopment, and to other federal agencies as noted below.

1.3 Groundwater Hydrology

Depth to groundwater was measured prior to sampling all wells at the AOCs within a 24-hour period. Plotting the synoptic groundwater elevation data allows for determination of groundwater flow direction and gradient, essential in understanding contaminant migration and evaluating the effectiveness of the monitoring well network. Groundwater and surface water elevations for the spring and fall 2023 LTM events are presented in Tables 1 and 2, respectively. The 2023 groundwater gradients are expressed in feet per foot (ft/ft) and AOC-specific groundwater elevation data are presented in sections specific to each AOC.

Annual precipitation data for 2004 through 2023, as reported from the Fitchburg Municipal Airport weather station, are presented in Table 3. The data indicate that precipitation across the area in February, May, October, and November was less than average for the period of record; April and December were near average (within one-half inch) for the period of record; and January, March, June, July, August, and September were greater than average for the period of record. The overall precipitation in 2023 (60.84 inches) was higher than the average of 43.96 inches for the period of record.

1.4 2023 Long-Term Monitoring Activities

1.4.1 Groundwater Sampling

Sampling activities were coordinated with the USACE – New England District, BRAC Environmental Coordinator office, contracted analytical laboratory, and stakeholders for each respective site. The laboratory provided

sampling supplies (sample containers, packing material, custody seals, and coolers) to the sampling team per the specific sample requirements presented in Table 4. Sampling equipment consisted of water quality meters, turbidity meters, bladder pumps, peristaltic pumps, and water levels meters that were tested before use. Well construction details (Table 5) were maintained on site during the sampling events to confirm well screen interval information as needed. The condition of the monitoring well network at each LTM site was inspected during the 2023 sampling events. Observations, if noted, are contained within the field sampling logs provided in Appendix A. Monitoring wells were found to be in good overall condition, and well locks were replaced if needed.

Monitoring wells were purged and sampled in accordance with Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (USEPA 2017b). Low-flow bladder or peristaltic pumps were used, as described in the LTMMP (Sovereign/HGL 2015). Samples submitted for dissolved metals analyses were field filtered through 0.45-micron filters directly into preserved sample bottles.

Non-dedicated sampling and monitoring equipment was decontaminated in accordance with the QAPP (S-A JV 2020). Field duplicate samples were collected during sampling events at each AOC, at the rate of 10% (i.e., one per 10 samples), to evaluate field precision. Matrix spike (MS)/matrix spike duplicate (MSD) pairs (one set per AOC) were also submitted to evaluate matrix effects on field and analytical precision and accuracy.

The field instruments used to measure water quality parameters (temperature, dissolved oxygen [DO], pH, oxidation-reduction potential [ORP], specific conductance, and turbidity) were calibrated twice daily (before and after field use) in accordance with the manufacturer's instructions and the Calibration of Field Instruments Standard Operating Procedure (USEPA 2017a). Equipment calibration log forms are provided in Appendix A. No instrument error was noted during the spring or fall LTM events.

Investigation-derived waste was not generated during the 2023 LTM activities. Purge water from wells was returned to the ground near sample collection locations in accordance with the LTMMP (Sovereign/HGL 2015).

1.4.2 Laboratory Testing

Eurofins TestAmerica Laboratories, Inc. Savannah (Eurofins) was the primary contract laboratory for the analysis of water samples for the spring and fall 2023 LTM events. Eurofins is compliant with the Quality Systems Manual for Environmental Laboratories, Version 5.4 (Department of Defense [DoD] 2021) under the DoD Environmental Laboratory Accreditation Program (ELAP) and holds current accreditation in accordance with the National ELAP for all applicable analytical methods.

For the Fall 2023 LTM event, Eurofins subcontracted all VPH samples to Katahdin Analytical Services, located in Westbrook, Maine, which were analyzed using the Massachusetts Department of Environmental Protection (MassDEP) analytical methods. Katahdin Analytical Services holds the MassDEP certification and DoD ELAP accreditation for these analyses.

Laboratory analytical results for water samples collected during the 2023 LTM events are discussed in Sections 2 through 6. Laboratory analytical reports are provided in Appendix B.

1.4.3 Data Validation

Quality assurance and quality control (QC) samples were collected and analyzed during the spring and fall 2023 groundwater sampling events to evaluate sample collection, transportation, and analysis procedures. Field duplicate samples were collected from monitoring wells 57M-96-11X (AOC 57, spring 2023), ZVM-99-22X (AOC

69W, fall 2023), XGM-97-12X (AOC 43G, fall 2023), 32M-01-18XBR (AOC 32/43A, spring 2023), and LFM-99-05A (DCL, spring and fall 2023).

Data validation was completed on all laboratory deliverables by Laboratory Data Consultants, Inc. (LDC), located in Carlsbad, California. Analytical results from the 2023 LTM events were evaluated for data acceptability in accordance with the Environmental Data Review Program Guidance (USEPA 2018), the Quality Systems Manual for Environmental Laboratories, Version 5.4 (DoD 2021), and the laboratory's defined acceptance limits. The method requirements for the USEPA SW-846 QC guidance and the MassDEP VPH and EPH methods were also used as supplemental information. The data validation reports are provided in Appendix C; a summary of quality control exceedances noted during data validation is also included in Appendix C.

LDC reviewed and updated the database with appropriate data qualifiers as needed. Laboratory analyses were confirmed to have been performed in general compliance with the precision, accuracy, representativeness, completeness, comparability, and sensitivity requirements listed in the QAPP (S-A JV 2020). Sample results that were qualified as estimated (UJ/J) due to quality control exceedances are usable with caution. The nitrate-nitrite as N result in sample LFM-99-02B-FAL23 was qualified as rejected (R) due to matrix spike/matrix spike duplicate (MS/MSD) recoveries less than 30%; the result is not usable. Analytical results reported for the spring and fall 2023 LTM samples were deemed valid and usable for intended purposes with the exception of the nitrate-nitrite as N result in sample LFM-99-02B-FAL23 that was rejected.

1.4.4 Data Evaluation

The analytical results for each AOC were compared to the respective monitoring criteria or cleanup goals (CGs) established in the applicable ROD. Arsenic results in groundwater were compared to the 10 micrograms per liter (µg/L) maximum contaminant level (MCL) that was promulgated in 2006, which is lower than the cleanup standard that was previously established in the site-specific RODs. Results are discussed in the AOC-specific sections that follow. Table 6 presents the site-specific contaminants of concern (COCs) and the associated CGs or comparison criteria for each AOC. Table 7 presents the DCL leachate discharge limits set by MassDevelopment in accordance with the Industrial Discharge Permit.

2 Area of Contamination 57

2.1 Site Background

AOC 57 is located between Barnum Road and Cold Spring Brook on the northeast side of what was formerly the Main Post of Fort Devens in Harvard, Massachusetts (Figure 1). AOC 57 is located within a Zone II aquifer protection area for the Town of Ayer Grove Pond public water supply wells. The area that includes AOC 57 was used primarily for storage and maintenance of military vehicles. AOC 57 consists of three subareas (Areas 1, 2, and 3) located south to southeast of Building 3713 and former Buildings 3756, 3757, and 3758 (Figure 2). Each subarea includes an upland area that slopes downward to a delineated wetland area bordering Cold Spring Brook. The subareas received stormwater runoff and waste from vehicle maintenance at former vehicle storage yards related to former Buildings 3713, 3757, and 3758.

A No Further Action ROD was completed for Area 1 (Harding 2001) following the removal of PAH-contaminated soil in 1997. The associated investigation revealed contaminated groundwater, soil, and sediment in Area 2. The Army completed a limited soil removal action at Area 2 in 1994, and it was discovered that contamination extended beyond the limits originally estimated. Approximately 1,300 cubic yards (yd^3) of soil were removed, and the site was transferred to the remedial investigation (RI)/feasibility study (FS) process. During spring 1999, a soil removal action focusing on PCBs and EPH in soil was performed at Area 3 based on data obtained from the RI.

Areas 2 and 3 are shown on Figures 3 and 4, respectively. In June 2000, the Army completed an RI at AOC 57 Areas 2 and 3 that revealed the presence of residual contamination at both sites. A ROD for Areas 2 and 3 was issued in September 2001 and selected excavation (for possible future use) and LUCs for Area 2, and excavation (to accelerate groundwater cleanup) and LUCs for Area 3. The excavations and product recovery activities are discussed in the Interim Removal Action Completion Report – AOC 57 (Conti Environmental, Inc. 2004). The data collected during the RI activities prompted an Explanation of Significant Differences in March 2004 to add EPH as a COC for Area 2.

Construction of a solar panel manufacturing facility between Areas 2 and 3 and Barnum Road (112 Barnum Road; Figure 2) was completed in 2009. The current occupant (Jabil, Inc.) produces healthcare products.

An active irrigation well is located adjacent to the building at 78 Barnum Road (Figure 2). The well is 505 feet deep and is believed to be an open borehole bedrock well. The property manager has indicated that the well is used for lawn care for the property from spring to fall and there is no flow meter to record the daily flow rate or volume of water used.

In March 2019, multiple debris areas were identified at AOC 57 between Areas 2 and 3, southeast of the walking path located behind 112 Barnum Road (Figure 2). Debris included rusted vehicle parts (metal debris, tires, and bumpers) and other smaller piles of rusted scrap metal (empty drums and containers). Large concrete slabs were also found. In November and December 2021, debris was removed from AOC 57 in accordance with the Debris Removal Workplan (S-A JV 2021); additional information is presented in the Final Debris Removal Activities Summary Report submitted to the USEPA in May 2022 (S-A JV 2022a).

2.2 Groundwater Hydrology

During spring 2023 LTM, water levels were collected at a total of 19 wells and piezometers prior to groundwater sampling, as presented in Table 1. A groundwater elevation contour map is shown on Figure 5 (Areas 2 and 3).

Data indicate that shallow groundwater flows toward Cold Spring Brook to the south/southeast, consistent with historical groundwater flow observations.

The groundwater hydraulic gradients for shallow groundwater within Areas 2 and 3 in spring 2023 were approximately 0.013 ft/ft (between upgradient well 57M-03-01X and downgradient well 57M-03-03X) and 0.026 ft/ft (between upgradient well 57M-95-03X and downgradient well 57M-96-11X), respectively (Figure 5). The calculated hydraulic gradients and depicted flow directions are consistent with those for previous years.

2.3 Groundwater and Surface Water Sampling

Groundwater and surface water in Area 3 was sampled historically on a semiannual basis from 2003 to 2007, and on an annual basis in the spring since 2008. The sampling program was modified in the LTMMP (Sovereign/HGL 2015) during 2015 to suspend sampling at Area 2; the LTMMP was finalized in accordance with provisions of the 1991 Devens FFA Section 7.8 and released without USEPA comment. Groundwater at AOC 57 is sampled annually in the spring. The spring 2023 LTM event consisted of collecting groundwater samples from two Area 3 monitoring wells (57M-95-03X and 57M-96-11X). Groundwater samples were analyzed for total metals (arsenic, iron, and manganese). One surface water location was also sampled during the spring 2023 LTM event (57-SW1) and was analyzed for dissolved metals (arsenic, iron, and manganese). The spring 2023 groundwater and surface water analytical results for Area 3 are presented in Tables 8 and 9, respectively.

2.3.1 Spring 2023 Data Summary

Exhibit 2-1, below, summarizes the analytes detected in groundwater samples collected from AOC 57 in spring 2023 that exceed the CG specified in the ROD (Harding 2001). Appendix D provides the data for 2003 through 2023, and Appendix E provides the Mann-Kendall trend analyses.

Exhibit 2-1 AOC 57 Area 3 Contaminant of Concern CG Exceedances, Spring 2023

Well Identification	Analyte	Groundwater CG (µg/L)[1]	Detected Result (µg/L)
57M-95-03X	Arsenic (total)	10	13 J
57M-96-11X	Arsenic (total)	10	20

Notes:
[1] The CG for arsenic in groundwater is the MCL standard.
J = estimated concentration

Total arsenic concentrations in well 57M-95-03X have been relatively stable, at or less than 60 µg/L with an average of 31 µg/L since the fall 2004 event. Total arsenic concentrations in well 57M-96-11X have varied more broadly through time, fluctuating between 20 and 470 µg/L from 2004 through 2023 (average of 194 µg/L). There is not a statistically significant trend for arsenic at either location.

One surface water sample was collected from location 57-SW1; the dissolved iron concentration (4,900 µg/L) exceeded the surface water benchmark. This is consistent with historical results, which have ranged from 240 to 21,000 µg/L historically and show variability from year to year.

Results of additional analytes screened against groundwater monitoring criteria and surface water benchmarks are presented in Tables 8 and 9, respectively. Figure 6 shows exceedances of the groundwater CG and surface water results compared to the surface water benchmarks for analyses required per the LTMMP (Sovereign/HGL 2015).

2.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each well while sampling and were used to determine groundwater stabilization prior to sampling. Final readings prior to collection of each sample are presented in Table 8.

ORP and DO data can be used to determine whether reducing or oxidizing conditions are present in groundwater. Low ORP values (less than 50 millivolts [mV]) and DO concentrations less than 1 milligram per liter (mg/L) are generally associated with reducing conditions. Reducing conditions are a typical byproduct of the biodegradation of fuel products and may result in solubilizing of naturally occurring arsenic (and other oxidation-reduction-sensitive metals such as iron and manganese) from native soils to groundwater. This results in elevated concentrations of these metals in groundwater at some locations, while some subsurface zones contain naturally occurring concentrations which are greater than their respective CGs. DO and ORP at well 57M-96-11X (ORP of 9.0 mV and DO of 0.17 mg/L) and well 57M-95-03X (ORP of -106 mV and DO of 0.13 mg/L) indicate that groundwater in these wells is generally reducing or moderately reducing. These locations are hydraulically downgradient of the Area 3 source area.

2.4 Land-Use Controls, Interviews, and Inspection

AOC 57 is owned by the Army but is leased to MassDevelopment per a Lease in Furtherance of Conveyance agreement. Under the Lease in Furtherance of Conveyance agreement, MassDevelopment must comply with the LUCs of the ROD (Harding 2001) to limit the potential exposure to the residual contaminated soil and groundwater under both existing and future site conditions. The LUCs ensure that exposure to any remaining contaminated soils beneath the site is controlled and prohibit groundwater extraction for industrial or potable water supply use. The initial site-specific annual LUC checklist, including physical on-site inspection and interview components, was developed in 2007 for use during LUC verification activities to ensure control requirements are being met. The checklist was updated in 2023 and included in a LUCIP prepared for AOC 57 (S-A JV, 2023f). Appendix F contains the completed checklist.

An annual LUC inspection was completed on November 29, 2023, which confirmed the following (Appendix F):

- No signs of increased exposure potential to the public from groundwater and/or surface water contaminants.
- No damage to on-site monitoring wells
- No evidence that groundwater extraction wells are present.
- Access to the site is sufficient for monitoring. Some minor vegetation clearance is needed adjacent to a subset of monitoring wells.
- No evidence of site use changes or increased exposure potential.

The S-A JV and Army conducted an interview on January 29, 2024 with Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), and Meg Delorier (MassDevelopment) which confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.

- No issues with site access for monitoring.

2.5 Conclusions and Recommendations

After removal of the source area in soil, natural attenuation processes have effectively reduced the remaining concentrations of site COCs (tetrachloroethene, cadmium, 1,4 dichlorobenzene, PCBs, and EPH C11-C22 aromatic carbon range) to less than their respective remediation goals (Sovereign/HGL 2015).

The 2023 LTM results at AOC 57 are consistent with the conceptual site model (CSM; HGL 2008). Total arsenic was detected at concentrations greater than the CG in wells 57M-95-03X and 57M-96-11X, which is consistent with historical observations. There is not a statistically significant trend for arsenic at either location. Groundwater at AOC 57 flows towards Cold Spring Brook; surface water samples collected from location 57-SW-1, adjacent to Area 3, have not identified arsenic concentrations at levels greater than the USEPA Water Quality Criterion (monitoring benchmark) of 150 µg/L since long-term monitoring started in 2003. Dissolved iron concentrations at 57-SW-1 have exceeded the monitoring benchmark of 1,000 µg/L in 16 of 20 sampling events completed since 2006, including the spring 2023 LTM event.

The remedial action selected in the ROD included the implementation of LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use (Harding 2001). The 2023 LUC inspections and interviews indicate that the LUCs continue to be in place and in effect.

The following recommendations are included for AOC 57:

- Continue annual sampling and LUC inspections in accordance with the LTMMP and LUCIP.
- Complete vegetation removal to maintain access to monitoring wells in wooded areas.
- Update the LTMMP to optimize the monitoring program.

3 Area of Contamination 69W

3.1 Site Background

AOC 69W is located by the northeast corner of the intersection of Jackson Road and Antietam Street on the northern portion of what was formerly the Main Post at Fort Devens (Figure 1), within the Zone II area associated with the MacPherson Well (Figure 7). It is currently being used for the Francis W. Parker Charter Essential School (former Devens Elementary School [Building 215]), its associated parking lot, and the adjacent lawn extending approximately 300 feet northwest to Willow Brook (Figure 7).

Historical impacts at AOC 69W are attributed to two separate releases of No. 2 heating oil in 1972 and 1978. The 1972 release occurred during the installation of a new 10,000-gallon underground storage tank (UST). The 1978 release resulted from a failed piping joint in the oil pipes that led to the old boiler. Actions, including installation of an oil recovery system, were performed to recover released fuel and oily water from each release (HLA 1999a). A removal action was performed in 1998 for soils and to remove the oil recovery system. The soil removal action was limited by the presence of the building.

The ROD (HLA 1999a) issued for AOC 69W in June 1999 selected limited action as the remedy for subsurface soils and groundwater, and included LTM, LUCs, and five-year reviews. LTM was developed to monitor for off-site migration of contaminants and verify that concentrations decreased through time. The ROD (HLA 1999a) listed arsenic and VPH/EPH to be analyzed. Sampling for VPH was discontinued in 2014; concentrations were less than criteria from 2009 through 2013. Well point 69WP-13-01 was installed in 2013 to monitor for potential migration of manganese based on manganese detected at 69WP-08-01 in 2008.

3.2 Groundwater Hydrology

During the fall 2023 LTM event, water levels were collected from a total of 17 wells and piezometers (Table 2). A water table elevation contour map is shown on Figure 8. Data from the fall 2023 LTM event indicates that groundwater flows in a north-northwest direction, and a groundwater gradient of 0.007 ft/ft was calculated between upgradient monitoring well ZWM-95-17X and downgradient well ZWM-95-18X (Figure 8). The hydraulic gradients and depicted flow directions are generally consistent with those for previous years.

3.3 Groundwater Sampling

Groundwater at AOC 69W is sampled annually in the fall. The fall 2023 LTM event consisted of collecting groundwater samples from eight monitoring wells and two well points (Table 10). In accordance with the LTMMP (Sovereign/ HGL 2015), the groundwater samples were analyzed for EPH and associated target analyte list PAHs, and/or dissolved metals (arsenic, iron, and/or manganese).

3.3.1 Fall 2023 Data Summary

Exhibit 3-1, below, summarizes the analytes detected in groundwater samples collected from AOC 69W in fall 2023 that exceed the CG specified in the ROD (HLA 1999a). Results of additional analytes screened against monitoring criteria are presented in Table 10. As shown in Table 10, neither EPH nor PAHs were detected above their respective monitoring criteria in the fall 2023 groundwater samples collected at AOC 69W. Figure 9 shows exceedances of the CG and monitoring criteria for analyses required per the LTMMP (Sovereign/HGL 2015).

Historical data at AOC 69W from 2000 through 2023 are provided in Appendix D. Mann-Kendall trend analyses are provided in Appendix E.

Exhibit 3-1 AOC 69W Contaminant of Concern CG Exceedances, Fall 2023

Well Identification	Analyte	Groundwater CG (µg/L)[1]	Detected Result (µg/L)
ZWM-99-22X	Arsenic (dissolved)	10	110
ZWM-99-23X	Arsenic (dissolved)	10	23

Note:

[1] The CG for arsenic in groundwater is the MCL standard.

Each of the above dissolved arsenic detections greater than the CG are consistent with historical observations. Out of the four wells (69W-94-13, ZWM-95-15X, ZWM-99-22X, and ZWM-99-23X) evaluated using Mann-Kendall analysis two wells (69W-94-13 and ZWM-99-23X) exhibit a statistically significant decreasing trend for dissolved arsenic.

3.3.2 Water Quality Parameters

Table 10 presents the readings for final field measured general water quality chemistry parameters (pH, temperatures, specific conductivity, ORP, DO, and turbidity) taken before collection of each groundwater sample. At AOC 69W, as described in Section 2.3.2 for AOC 57, low DO and ORP, indicating reducing conditions in groundwater, generally correlate with increased detected concentrations of metals. Monitoring well ZWM-99-22X, for example, had relatively low ORP and DO concentrations (-29.2 mV and 0.46 mg/L, respectively) and the highest concentration of arsenic detected (110 µg/L; 120 µg/L in duplicate sample) in fall 2023.

3.3.3 Land-Use Controls, Interviews, and Inspection

Ownership of AOC 69W was transferred from the Army to MassDevelopment in August 2007. MassDevelopment later transferred ownership of AOC 69W to the Francis W. Parker Charter Essential School, the current owner. LUCs were implemented to limit potential exposure to contaminated soil and groundwater under existing and future site conditions, per the ROD (HLA 1999a) and a subsequent deed (Army and MassDevelopment 2007). LUCs ensure that the remaining contaminated soils beneath and adjacent to the building are not excavated and prohibit groundwater extraction from the site for industrial or potable water supply use. Land use is evaluated as part of the five-year review process to ensure control requirements are being met. A site-specific annual LUC checklist (Appendix F), including physical on-site inspection and interview components, was initially developed in 2007 for use during LUC verification activities. The checklist was updated in 2023 and included in a LUCIP prepared for AOC 69W (S-A JV, 2023g). Appendix F contains the completed checklist.

An annual LUC inspection was performed on November 28, 2023, which confirmed the following (Appendix F):

- No evidence (repaved cut marks or penetrations in the pavement) within the Excavated Soils Management Area (ESMA) that have not been otherwise identified and properly documented by the property owner.
- No evidence of damage to the remedy or change to the area overlying the ESMA.
- No evidence that groundwater extraction wells are present.

- Access to the site is sufficient for monitoring. The S-A JV completed a vegetation removal event in October 2023 to improve access to monitoring wells in the wooded area north of the ESMA; the work was coordinated with MassDevelopment and the property owner.
- No signs of increased exposure potential.

An interview was conducted on January 29, 2024 with Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), and Meg Delorier (MassDevelopment). In addition, Michelle McKenna (Business Manager of Francis W. Parker Charter Essential School) was contacted via email on January 11, 2024. The interviews confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No excavations (planned or emergency) north of the school were conducted within the ESMA.
- No issues with site access for monitoring.

Michelle McKenna indicated that a retaining wall/sidewalk project (previously on hold) is anticipated to be completed in 2024. The MassDEP, USEPA and USACE approved a soil management plan and health and safety plan for this project on January 11, 2024.

3.4 Conclusions and Recommendations

The 2023 LTM results are consistent with the CSM (HGL 2008). The LTM dataset indicate that arsenic concentrations have either remained table or exhibited a decreasing trend since 2009, VPH is no longer sampled due to being less than criteria, and EPH results have been less than monitoring criteria since the fall 2019 LTM event. The detected dissolved metal concentrations fluctuate in response to oxidation-reduction conditions in the shallow groundwater.

The ROD (HLA 1999a) remedy includes LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. 2023 LUC inspections and interviews indicate the LUCs continue to be in place and in effect.

The following recommendations are included for AOC 69W:

- Continue annual groundwater sampling and LUC inspections in accordance with the LTMMP and LUCIP.
- Continue annual vegetation removal events to maintain access to monitoring wells in wooded areas.
- Update the LTMMP to optimize the monitoring program.

4 Area of Contamination 43G

4.1 Site Background

AOC 43G is in the central portion of the former Main Post of Fort Devens (Figure 1), at the southwestern corner of Pine Road and Queenstown Street, as shown on Figure 10. AOC 43G consists of the former Army Air Force Exchange Service (AAFES) gas station (Areas 2 and 3) and historical Gas Station G (Area 1) and has been the subject of RIs associated with petroleum contamination resulting from past operations. The former gas station was used as a motor pool fueling station during the World War II era. USTs identified at AOC 43G were removed.

In October 1996, the Army conducted an FS to evaluate potential remedial alternatives and signed a ROD (USEPA 1996) to document the selected remedy. The selected remedial action includes intrinsic bioremediation, groundwater and contaminant modeling, and long-term groundwater monitoring. Intrinsic bioremediation is a remedial approach that relies on natural attenuation processes to remediate contaminants in the subsurface. Components of the selected remedy include assessment, data collection, groundwater modeling, LTM, annual reporting to the USEPA and MassDEP, and performing five-year reviews.

4.2 Groundwater Hydrology

During fall 2023 LTM, water level measurements were performed at a total of 11 wells at AOC 43G. Table 2 presents the groundwater elevations and Figure 11 shows a groundwater elevation contour map. The groundwater flow direction is to the east/southeast consistent with the local topography, eventually discharging to surface water via an unnamed tributary to Robbins Pond and to Robbins Pond itself. The calculated hydraulic gradient (0.051 ft/ft between upgradient well XGM-97-12X and downgradient well AAFES-7; Figure 11) and depicted flow direction are generally consistent with those for previous years.

4.3 Groundwater Sampling

Groundwater at AOC 43G is sampled annually in the fall. Fall 2023 LTM at AOC 43G consisted of collecting groundwater samples from five monitoring wells (Table 11). In accordance with the LTMMP (Sovereign/HGL 2015), the groundwater samples were analyzed for VPH and target analyte VOCs, alkalinity, and total metals (iron and/or manganese).

4.3.1 Fall 2023 Data Summary

Exhibit 4-1, below, presents the analytes detected in groundwater samples collected from AOC 43G in fall 2023 that exceed the CGs specified in the ROD (USEPA 1996). Results of additional analytes screened against monitoring criteria are presented in Table 11. Figure 12 shows exceedances of the CGs and monitoring criteria for analyses required per the LTMMP (Sovereign/HGL 2015). Appendix D contains the AOC 43G historical data from 1999 through 2023, while Appendix E presents the Mann-Kendall statistical trend analyses of selected wells.

Exhibit 4-1 AOC 43G Contaminant of Concern CG Exceedances, Fall 2023

Well Identification	Analyte	Groundwater CG (µg/L)[1]	Detected Result (µg/L)
AAFES-2	Iron (total)	9,100	16,000
	Manganese (total)	375	4,400
XGM-93-02X	Manganese (total)	375	940
XGM-94-04X	Manganese (total)	375	440
XGM-97-12X	Iron (total)	9,100	37,000
	Manganese (total)	375	2,000
	Benzene	5	6.3

Note:

[1] The CG for iron is the background level. The CG for manganese is a site-specific goal established as part of the Long-Term Monitoring Plan (LTM Plan; HGL 2008).

Total manganese exceeded the 375 µg/L CG in four of five sampled wells. Concentrations were observed to be consistent with historical data. Of the wells evaluated using Mann-Kendall, three of five wells, AAFES-2, XGM-93-02X, and XGM 97-12X had statistically significant decreasing trends for total manganese. There was not a statistically significant trend at well XGM-94-04X or well AAFES-7.

Total iron exceeded the 9,100 µg/L CG in two of four sampled wells. Out of the three wells, AAFES-2, XGM-93-02X, and XGM 97-12X evaluated using Mann-Kendall, two wells AAFES-2 and XGM-93-02X had statistically significant decreasing trend in total iron concentrations.

Total benzene exceeded the 5 µg/L CG in one of four sampled wells (XGM-97-12X). Well XGM-97-12X was the only well evaluated using Mann-Kendall and had a statistically significant decreasing trends for benzene.

VPH (C5-C8 Aliphatics, C9-C10 Aromatics, and C9-C12 Aliphatics) did not exceed their respective monitoring criteria in any of the sampled locations. Specific information on each carbon fraction is provided below:

- There was a statistically significant decreasing trend for C5-C8 Aliphatics at three of four wells evaluated (AAFES-2, XGM-93-02X, and XGM-97-12X; there was not a statistically significant trend at well XGM-94-04X).
- There was a statistically significant decreasing trend for C9-C10 Aromatics at two of three wells evaluated (AAFES-2 and XGM-97-12X; there was not a statistically significant trend at well XGM-94-04X).
- There was not a statistically significant trend for C9-C12 Aliphatics at both wells evaluated (AAFES-2 and XGM-97-12X).

4.3.2 Water Quality Parameters

Table 11 presents the readings for final field-measured general water quality chemistry parameters (pH, temperatures, specific conductivity, ORP, DO, and turbidity) taken before collection of each groundwater sample. The ORP and DO data (Table 11) indicate reducing conditions in groundwater at four of the five wells sampled (AAFES-2, XGM-93-02X, XGM-94-04X, and XGM-97-12X). Exceedances of the CGs for iron and manganese are

observed at each of these locations. Historical data indicate that the oxidation-reduction conditions and associated metals concentrations are variable at several locations. However, it is assumed that the natural degradation of the residual petroleum in the subsurface has changed the geochemical conditions of the groundwater, which resulted in elevated concentrations of naturally occurring iron and manganese due to reductive dissolution processes.

4.4 Land-Use Controls, Interview, and Inspection

AOC 43G is currently under Army ownership. Per the ROD (USEPA 1996), substantive requirements of LUCs that restrict access to contaminated groundwater and soil are in place at AOC 43G. The Addendum to the Real Property Master Plan (Army 2007) included supplemental information on LUCs established under BRAC and Comprehensive Environmental Response, Compensation, and Liability Act programs that are applicable to AOC 43G. The LUCs were designed to protect the integrity and effectiveness of the remedy. Any proposed actions that affect the AOC 43G property must meet the following requirements of the ROD (USEPA 1996):

- Ensure that the property is not used for residential purposes and prohibit the use of groundwater beneath the site.
- If the Army transfers the property by lease or deed, an environmental baseline survey will be conducted to ensure that the remedy remains protective by incorporating all necessary environmental protection provisions within the Finding of Suitability to Transfer and the property transfer deed.
- Any intrusive construction work must consider that residual soil and groundwater contamination has been documented for AOC 43G, and such actions should be coordinated with the Department of Public Works and BRAC.

An annual LUC inspection was performed on November 29, 2023, which confirmed the following (Appendix F):

- No evidence of development or damage in the area of the remedy.
- Minor damage to monitoring wells. Some bollards and wooden stakes installed around monitoring wells are in need of replacement/repair; this was observed previously and well repairs will be scheduled during planned future site activities.
- No evidence that groundwater extraction wells are present.
- The access is sufficient to the site for monitoring.
- No signs of increased exposure potential.

Penelope Reddy (USACE) was contacted via email on January 11, 2024, and confirmed the following (Appendix F):

- The interviewee is familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.
- No issues with site access for monitoring.

4.5 Conclusions and Recommendations

Based on the previous remedial activities performed at AOC 43G and evaluation of the available monitoring data, the 2023 monitoring results are consistent with the CSM (HGL 2008). The LTM dataset indicate that there is a

general decreasing trend in total manganese and total iron concentrations at wells that exceed the CGs for these COCs. There was one exceedance of the CGs for benzene during the fall 2023 LTM; benzene is one of the target VOCs listed in the ROD. As shown in Appendix D, the fall 2023 benzene concentrations at this location are within the range of sampling results over the last 10 years, and there is an overall decreasing trend since LTM sampling began in 1999 (Appendix E).

The ROD remedy includes LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. The 2023 LUC inspections and interviews indicate the LUCs continue to be in place and in effect.

The following recommendations are included for AOC 43G:

- Continue annual groundwater sampling and LUC inspections in accordance with the LTMMP.
- Complete monitoring well and bollard repairs, as noted during the 2023 LUC inspection.
- Update the LTMMP to optimize the monitoring program.

5 Areas of Contamination 32 and 43A

5.1 Site Background

AOCs 32 and 43A are located east of Cook Street and north of Independence Drive (Figure 13). A portion of AOC 32 intersects a MassDEP 310 Code of Massachusetts Regulations 22.02 Zone II aquifer protection area associated with the five Grove Pond wells (Public Water Supply IDs 2019000-01G, 2019000-02G [inactive], 2019001-06G, 2019001-07G, and 2019001-08G).

AOC 32 (Defense Reutilization and Marketing Office Yard) was an active materials storage facility from approximately 1964 to 1995. It consisted of three fenced areas where various materials were processed and stored, as well as a former waste oil UST (UST #13). The tank was removed in 1992 and associated contaminated soils were excavated and disposed of off-site. COCs at AOC 32 include select VOCs and metals (arsenic and manganese). Monitored natural attenuation (MNA) is the selected remedy for groundwater contamination. Figure 13 shows the new warehouse at AOC 32 overlying the footprint of the former features.

AOC 43A (Petroleum, Oils, and Lubricants Storage Area) served as the central distribution point for all gasoline stations at Fort Devens during the 1940s and 1950s and was subsequently used to store fuels for various purposes. The distribution facility consisted of a main gasoline station, a pump house, four 12,000-gallon USTs, one 10,000-gallon UST, two 12,000-gallon aboveground storage tanks, and two 8,000-gallon aboveground storage tanks. Gasoline was delivered by rail car and transferred to the tanks. Site investigation indicated that low levels of xylenes and an elevated level of petroleum hydrocarbons was present in the subsurface soils. MNA was chosen as the selected remedy for groundwater and was incorporated into the ROD (Horne 1998).

A remedial action, consisting of in-situ chemical oxidation via persulfate injections, was implemented in February 2009 to augment the MNA remedy at AOC 32 near the former USTs. The remedial action targeted the remaining site COCs, including the dichlorobenzene (DCB) isomers, at well 32M-01-18XBR. The findings and conclusions for this remedial action are discussed in the AOCs 32 and 43A Persulfate Injection Letter Report (HGL 2009).

5.2 Groundwater Hydrology

During the spring 2023 LTM event, water level measurements were collected from a total of 26 monitoring wells and piezometers screened in both the overburden and bedrock aquifers. Table 1 presents the water level measurements. Groundwater elevation contour maps prepared for the overburden and bedrock aquifers in AOC 32/43A (Figures 14 and 15, respectively) show that groundwater generally flows to the south/ southwest with a component of southeasterly flow on the east side of the area, consistent with the site's historical flow patterns. The following hydraulic gradients were calculated based on spring 2023 LTM data:

- *Overburden, to the southwest*. Approximately 0.021 ft/ft between upgradient monitoring well 32Z-01-08XOB and downgradient well 43M-01-16XOB (Figure 14).
- *Overburden, to the southeast*. Approximately 0.03 ft/ft between upgradient monitoring well 32Z-01-07XOB and downgradient well 32M-01-14XOB (Figure 14).
- *Bedrock, to the south/southwest*. Approximately 0.028 ft/ft between upgradient monitoring well 32Z-01-12XBR and downgradient well 43M-01-16XBR (Figure 15).
- *Bedrock, to the southeast*. Approximately 0.045 ft/ft between upgradient monitoring well 32Z-01-06XBR and downgradient well 32M-01-14XBR (Figure 15).

- *Bedrock, to the east*. Approximately 0.029 ft/ft between upgradient monitoring well 32M-01-15XBR and downgradient well 32M-01-17XBR (Figure 15).

The calculated hydraulic gradients and depicted flow directions are generally consistent with those for previous years.

Four sets of overburden and bedrock well pairs were assessed with respect to the presence of vertical gradients, as shown in Exhibit 5-1, below.

Exhibit 5-1 AOC 32/43A Vertical Gradients, Spring 2023

Location[1]	Depth to Water (feet below MPE)	Groundwater Elevation (feet NAVD88)	Bottom of Screen (feet NAVD88)	Top of Screen (feet NAVD88)	Mid-Point of Screen (feet NAVD88)	Mid-Point of Screen Separation (feet)	Vertical Gradient Spring 2023[2]
32M-01-14XOB	24.43	232.13	227.10	237.10	232.10	16.80	**-0.090**
32M-01-14XBR	22.42	233.64	210.30	220.30	215.30		
43M-01-16XOB	24.41	232.47	223.13	233.13	228.13	23.56	**0.002**
43M-01-16XBR	24.42	232.42	199.57	209.57	204.57		
43M-01-17XOB	26.01	232.07	225.11	235.11	230.11	24.07	**-0.002**
43M-01-17XBR	26.16	232.13	201.04	211.04	206.04		
43M-01-20XOB	25.84	231.56	223.64	233.64	228.64	44.05	**-0.001**
43M-01-20XBR	25.69	231.61	179.59	189.59	184.59		

Notes:

[1] The OB and BR designations associated with the location (i.e., well identification) denote overburden and bedrock, respectively.
[2] A negative vertical gradient indicates an upward vertical gradient, and a positive vertical gradient indicates a downward vertical gradient.
MPE = measuring point elevation
NAVD88 = North American Vertical Datum of 1988

Most well pairs have negative vertical gradients, which indicate there is an upward flow component. Upward vertical gradients have been observed consistently at all well pairs over the last five years, except for the Spring 2023 LTM event at well pair 43M-01-16XOB/XBR and the Spring 2019 event at well pair 43M-01-20XOB/XBR. This is consistent with the site's historical flow patterns, with the magnitude of the gradients fluctuating somewhat from event to event, possibly due to differences in precipitation (Table 3). There are no COCs in groundwater that exceed CGs at AOC 32/43A where these well pairs are located. In general, groundwater in AOC 32/43A appears to preferentially flow laterally as compared to vertically, as the vertical gradients were observed to be less than the calculated hydraulic gradients.

5.3 Groundwater Sampling

LTM activities at AOC 32/43A were conducted in spring 2023. In accordance with the LTMMP (Sovereign/ HGL 2015), four wells were sampled for VOCs, VPH and BTEX, and total metals (arsenic and manganese).

5.3.1 Spring 2023 Data Summary

Exhibit 5-2, below, presents the analytes detected in groundwater samples collected from AOC 32/43A in spring 2023 that exceed the CGs specified in the ROD (Horne 1998). Results of additional analytes screened against monitoring criteria are presented in Table 12. Figure 16 shows exceedances of the CGs and monitoring criteria for analyses required per the LTMMP (Sovereign/HGL 2015). Appendix D provides historical data from 2006 through 2023, while Appendix E provides the Mann--Kendall statistical trend analyses of selected wells.

Exhibit 5-2 AOC 32/43A Contaminant of Concern CG Exceedances, Spring 2023

Well Identification	Analyte	Groundwater CG (µg/L)[1]	Detected Result (µg/L)
32M-01-14XOB	Arsenic (total)	10	12

Note:
[1] The CG for arsenic and select VOCs in groundwater is the MCL; the CG for manganese in groundwater is the background level.

Arsenic has been historically detected at concentrations greater than the CG in well 32M-01-14XOB. The current arsenic concentration in well 32M-01-14XOB (12 µg/L) is greater than the CG but is less than the historical average of 50 µg/L in samples collected since spring 2006. Arsenic concentrations exhibit a statistically significant decreasing trend in well 32M-01-14XOB.

Following in-situ chemical oxidation injections in 2009, concentrations of 1,2-DCB, 1,3-DCB, 1,4-DCB, and VPH (C9-C10 Aromatics) in well 32M-01-18XBR have decreased significantly. Concentrations of 1,3-DCB, 1,4-DCB, chlorobenzene, VPH (C9-C10 Aromatics), and total manganese in well 32M-01-18XBR exhibit a statistically significant decreasing trend (Appendix E).

5.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each of the four sampled wells concurrent with low-flow sampling and were used to verify groundwater stabilization within each well before sampling (Table 12). The ORP and DO data recorded prior to sampling (Table 12) indicate that groundwater at AOC 32/43A is generally oxidizing. Concentrations of arsenic and manganese in groundwater are expected to continue to decrease through time as they come out of solution under oxidizing conditions.

5.4 Land-Use Controls, Interviews, and Inspection

O'Reilly Automotive, Inc. currently owns and operates the property at AOC 32/43A. LUCs were established per the ROD (Horne 1998) and restricted the use of groundwater at the site, preventing both industrial and potable use of groundwater. LUCs are verified during annual sampling events in accordance with the 2015 LTMMP (HGL/Sovereign 2015). Appendix F provides a site-specific annual LUC checklist, including physical onsite inspection and interview components. An annual in-depth LUC inspection was performed on November 29, 2023, which confirmed the following:

- No evidence of development or damage in the area of the remedy.

- Minor damage to monitoring wells. Some roadboxes were observed to have cracked concrete; these locations will be monitored if/when future repairs are needed.
- No evidence that groundwater extraction wells are present.
- As described in the previous annual report (S-A JV, 2023h), several pavement cut-outs were observed during the December 7, 2022, LUC inspection; the cut-outs were in the paved parking/roadway area to the east of the O'Reilly building and related to a historical spill of diesel fuel. During the November 29, 2023, LUC inspection, all cut-outs were observed to be repaired except for one; O'Reilly Automotive was notified of the current site conditions.
- The access is sufficient to the site for monitoring.
- No signs of increased exposure potential.

The S-A JV and Army conducted an interview on January 29, 2024, with Anne-Marie Dowd (MassDevelopment) Meg Delorier (MassDevelopment), and Neil Angus (Devens Enterprise Commission). In addition, John Bounds (O'Reilly Automotive) was contacted separately via email on January 11, 2024, and responded via phone on March 1, 2024. The interviews confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No issues with site access for monitoring.

5.5 Conclusions and Recommendations

Groundwater flow at AOC 32/43A in 2023 was generally consistent with the site's historical flow patterns. The 2023 groundwater elevations indicate a minor upward flow component from bedrock to overburden in most areas, which is consistent with historical observations; the area of strongest upward flow has generally been observed at the 32M-01-14XOB/XBR well couplet. Historical fluctuations in the vertical gradients may be due to changes in precipitation amounts from year to year (Table 3). There are no COCs in groundwater that exceed CGs at AOC 32/43A where the overburden/bedrock well pairs used to calculate vertical gradients are located.

The 2023 LTM results are consistent with the CSM (HGL 2008). At source area well 32M-01-18XBR, Mann-Kendall evaluation indicates 1,3-DCB,1,4-DCB, chlorobenzene, VPH (C9-C10 Aromatics), and total manganese have statistically significant decreasing trends in concentrations through time (Appendix E). Arsenic exceeded the CG in downgradient well 32M-01-14XOB but has statistically significant decreasing trend in concentrations through time (Appendix E) and was detected slightly above the cleanup goal. There were no other exceedances of CGs or monitoring criteria for COCs during the 2023 sampling event.

The following recommendations are included for AOC 32-43A:

- Continue annual groundwater sampling and LUC inspections in accordance with the LTMMP.
- Complete monitoring well repairs, as noted during the 2023 LUC inspection.
- Update the LTMMP to optimize the monitoring program.

6 Devens Consolidation Landfill

6.1 Site Background

The DCL was constructed on the former Fort Devens golf course driving range to accommodate excavated material from seven remedial areas consisting of two study areas (SAs), four AOCs, and one pesticide removal project at three Fort Devens HAs. The seven DCL contributor sites were:

- *SA 12*. Construction debris and yard waste (approximately 8,700 yd^3).
- *SA 13*. yard-waste (approximately 10,000 yd^3).
- *AOC 9*. Wood, concrete, asphalt, metal, brick, glass, and tree stumps (approximately 121,000 yd^3).
- *AOC 11*. Wood-frame hospital demolition debris (approximately 35,000 yd^3).
- *AOC 40*. Construction debris, ash, stumps, and logs (approximately 125,000 yd^3).
- *AOC 41*. Nonexplosive material and household debris (approximately 1,500 yd^3).
- *Grant, Locust, and Cavite HAs*. Soils and walling material (approximately 3,530 tons).

The DCL contributor sites and the DCL are shown on Figures 1 and 17, respectively.

The ROD (HLA 1999b) included on- or off-site disposal options. The on-site landfill construction alternative was selected as the preferred alternative. Construction of the DCL began in September 2000 and was complete in November 2002. The Remedial Action Closure Report (Shaw Environmental Inc. [formerly Stone and Webster, Inc.] 2003) was accepted, certifying that the DCL was constructed and capped in accordance with the ROD (HLA 1999b), and was meeting the performance standards and/or response objectives of the remedial action. The ROD (HLA 1999b) required subsequent collection of samples from groundwater monitoring wells at DCL, in accordance with 310 Code of Massachusetts Regulations 19-132, to assess remedy effectiveness. LTM has been performed since completion of DCL construction.

In 2023, the USACE operated and inspected the landfill facility, and the S-A JV conducted the groundwater and leachate discharge sampling. Landfill leachate is discharged to the Fort Devens sewage system under an industrial wastewater discharge permit. Effluent criteria (established in 2006 and updated in 2009) and reporting requirements are specified in the leachate discharge permit.

In addition to the monitoring activities (Section 6.5), annual landfill maintenance activities were completed in 2023, including mowing of the landfill cap.

6.2 Groundwater Hydrology

During spring and fall 2023 LTM at DCL, water level measurements were performed at a total of seven monitoring wells. Tables 1 and 2 present the measurements and corresponding calculated groundwater elevations for bedrock wells in the spring and fall 2023, respectively. Groundwater flow is to the northeast, as shown on Figures 18 and 19 for spring and fall 2023, respectively. The gradient was approximately 0.042 ft/ft in both spring 2023 (Figure 18) and fall 2023 (Figure 19), using upgradient monitoring well LFM-99-02B and LFM-99-05B, respectively. These observations are consistent with historical observations at DCL.

6.3 Groundwater Sampling

Groundwater sampling is completed semiannually in accordance with the LTMMP (Sovereign/HGL 2015). A total of four wells were sampled in spring 2023 and fall 2023. Samples were analyzed for the following parameters: VPH, EPH, pesticides, total metals (select list), TDS, chloride/sulfate, nitrate/nitrite, alkalinity, cyanide, and COD. Tables 13 and 14 present the analytical results for the spring and fall 2023 LTM wells.

Water level measurements were performed at monitoring wells LFM-99-01B, LFM-99-03B, and LFM 99-05B during the spring and fall 2023 LTM events to evaluate if these wells should also be sampled. If the depth to water is less than the trigger depth (i.e., higher water table elevation), there is a potential for groundwater to come into contact with the bottom of the landfill, triggering the requirement to also sample these locations. Exhibit 6-1, below, lists the shallow trigger depths, along with groundwater elevations from spring and fall 2023. Sampling of these wells was not required in 2023, because the elevation for all wells was below the trigger depth.

Exhibit 6-1 Water Level Readings for Select DCL Monitoring Wells, Spring and Fall 2023 LTM

Well Identification	Top of Casing Elevation (feet NAVD88)	Groundwater Elevation Trigger for Required Sampling (feet NAVD88)	Groundwater Elevation Spring 2023 (feet NAVD88)	Groundwater Elevation Fall 2023 (feet NAVD88)
LFM-99-01B	350.67	345.00 or greater	325.37	324.82
LFM-99-03B	342.08	335.00 or greater	301.21	302.02
LFM-99-05B	316.58	315.00 or greater	296.64	297.30

6.3.1 2023 Long-Term Monitoring Data Summary

Tables 13 and 14 present analytical results from spring and fall 2023 LTM, respectively. Concentrations of EPH, VPH, pesticides, total metals, and cyanide were either non-detect or less than the monitoring criteria, consistent with historical data collected since 2003. Results of spring and fall 2023 general chemistry parameters (total cyanide, COD, TDS, chloride, sulfate, nitrate/nitrite, and total alkalinity) were consistent with historical data (Tables 13 and 14). Appendix D contains the DCL historical data from 2003 through 2023.

6.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each of the sampled wells concurrent with low-flow sampling, and were used to verify groundwater stabilization within each well before sampling. Tables 13 and 14 provide the final field readings taken before collection of each groundwater sample. Groundwater at these wells was oxic in both 2023 events (ORP greater than 50 mV and DO greater than 1 mg/L). Historically, COC detections at DCL wells have been sporadic and low concentration. No definitive correlation has been established between measured water quality parameters and the presence or absence of contamination in the sampled wells.

6.4 Leachate System Monitoring

The DCL is permitted to discharge industrial wastewater to the Fort Devens sewerage system in accordance with Industrial Discharge Permit No. 017 granted by MassDevelopment. Leachate sampling is performed each year between October 1 and December 31, and self-monitoring reports are due to MassDevelopment by January 5 the following year. On November 7 and November 14, 2023, samples were collected from the leachate system building (located to the east of the landfill) and submitted to Eurofins for analysis of VOCs, SVOCs, pesticides, PCBs, gasoline-range organics, total metals (select list), total suspended solids, pH, total phenolics, and total cyanide. Table 15 presents the analytical results. There were no permit exceedances for any parameters.

In addition to leachate sampling, the DCL system is inspected monthly and leachate discharge volumes are recorded. Monitoring results are used to calculate leachate discharge quantities for comparison with historical discharge data. As presented in Table 16, the annual leachate discharge quantity from 2023 (322,448 gallons) was consistent with previous annual quantities (Table 3).

6.5 Landfill Inspection and Gas Monitoring

Since its completion, the DCL has been inspected on a routine basis to ensure controls remain in place to be protective of human health and the environment. The inspection frequency was changed from semiannual to annual in 2008 (HGL 2008). Since the cap was completed in 2002, post-closure inspection and monitoring has now been performed for 22 years. Planning should commence for the performance time and metrics to reduce LTM and sampling activities, or to perform them as a reduced frequency, after 30 years, in accordance with Resource Conservation and Recovery Act Subtitle C landfill cap regulations for post-closure monitoring periods of performance.

S-A JV and USACE personnel inspected the DCL landfill on October 31, 2023, and recorded observations regarding the vegetative cover, vegetation types, erosion, settlement, and general condition of various features. Appendix G provides the fall 2023 inspection report. Primary findings are summarized below:

- The landfill cap and perimeter drainage system were found to be in good condition, with no apparent settlement or significant erosion.
- In general, the vegetative cap appeared healthy. As noted during previous inspections, some small, woody shrub species have invaded the perimeter drainage system and the landfill cap. The woody vegetation is cut low to the ground during annual mowing.
- The perimeter fence is in fair condition adjacent to the security gate. The fence along with the security gate and perimeter drainage system minimize potential entry onto the landfill cap by motor vehicles. These access limitations appear to be adequate.
- The cap drainage system was observed to be in good condition. Drainage channels were free of sediment and debris, with no significant settlement or stone displacement. The gabion slope drains were in good condition, with minimal vegetation present.
- Perimeter toe drains were in good condition and appeared to be functioning properly, with no visible signs of erosion or stability issues.
- The detention basin northeast of the DCL was also noted to be in good condition. Its pond drains, culvert, and outfall areas were generally free of debris and vegetative growth.
- Gas vents and monitoring wells were observed to be in good condition.

In 2016, the TaraVista Behavioral Health Center was constructed at 85 Patton Road, Devens, Massachusetts, approximately 150 feet east of the southeastern edge of the landfill. The MassDEP requested that gas probes be installed between the landfill and the new structure, and that landfill gas monitoring be conducted to evaluate whether landfill gas is migrating from the landfill through soil and/or in groundwater that could create a hazardous condition in the area of the new structure. The Army prepared the Work Plan for Installation of Perimeter Landfill Gas Monitoring Wells (KGS 2018) and installed and sampled three gas probes (LFGM-18-01, LFGM-18-02, and LFGM-18-03) on December 7, 2018 (Figure 17). Appendix G presents the results of sampling of the three gas probes conducted on December 1, 2023. Methane, the primary explosive landfill gas COC that could be generated from the DCL, was not detected (0% lower explosive limit). VOC results ranged from 0 to 0.3 parts-per-million, and carbon dioxide ranged from 0 to 4.9%. Hydrogen sulfide and carbon monoxide were not detected. Therefore, no soil gas hazard for occupants of the adjacent building was identified.

Primary recommendations are summarized below, and details are provided in Appendix G:

- Routine and general landfill maintenance activities that will continue to be performed include annual mowing and control of encroaching vegetation, such as clearing large/woody vegetative growth from the cap, drainage channels, and riprap. Small shrubs growing on the landfill cap should continue to be cut low during the annual mowing, and/or cut as flush to the ground as feasible during the annual maintenance program.
- Annual mowing of the cap will be done no earlier than September 1 to avoid harming ground-nesting songbirds. Mowing will include the adjacent open field and detention pond areas.
- The annual inspection of landfill cap components will continue. The inspection should continue to be performed in the fall, soon after mowing is completed (i.e., within 1 to 2 weeks) and preferably within 48 hours after a precipitation event to help inspect the effectiveness of surface runoff in the drainage swales. Landfill gas monitoring should be performed on a dry day.

6.6 Land-Use Controls, Interviews, and Inspection

MassDevelopment owns the DCL property and granted the Army a permanent easement in 2001 to build and operate the landfill (Army and MassDevelopment 2001). DCL contributor sites AOC 9, AOC 40, and SA 13 were transferred from the Army to MassDevelopment in March 2006. The March 2006 deed included use restrictions on the contributor sites to prevent residential development of the properties (Army and MassDevelopment 2006).

LUC inspections are conducted per the LTMMP (Sovereign/HGL 2015). Appendix F contains site-specific annual LUC checklists for the DCL and its contributor sites, AOC 9, AOC 40, and SA 13, including physical on-site inspection and interview components.

An LUC inspection was performed of the DCL on October 31, 2023, which confirmed the following:

- No evidence of development or damage in the area of the remedy.
- No damage to monitoring wells.
- No evidence that groundwater extraction wells are present.
- The access is sufficient to the site for monitoring.
- No signs of increased exposure potential.

The S-A JV and Army conducted an interview on January 29, 2024, with Anne-Marie Dowd (MassDevelopment) and Mr. Neil Angus (Devens Enterprise Commission) regarding the following items:

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No issues with site access for monitoring.

In addition to the on-site DCL inspection, an LUC inspection of the DCL contributor sites (AOC 9, AOC 40, and SA 13) was performed on November 28-29, 2023. Findings revealed no abnormalities or changes in land use (Appendix F), and there was no evidence of residential development.

6.7 Conclusions and Recommendations

The 2023 results for the DCL groundwater monitoring wells are consistent with groundwater results from previous LTM events. There were no exceedances of the DCL Wastewater Discharge Permit No. 017 criteria for leachate in October 2023.

The ROD (HLA 1999b) remedy and LTM Plan (HGL 2008) include LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. The 2023 LUC inspections and interviews indicate the LUCs continue to be in place and in effect for both the DCL and contributor sites (AOC 9, AOC 40, and SA 13). Per the requirements of the 2006 transfer deed, these contributor sites are not being used, or under development, for residential purposes.

The following recommendations are included for DCL:

- Continue semiannual groundwater sampling and annual LUC inspections in accordance with the LTMMP.
- Continue annual mowing of landfill cap, and landfill gas monitoring.
- Update the LTMMP to optimize the sampling and monitoring program.

7 Housing Areas and 37-Millimeter Impact Area

7.1 Site Background

The Grant HA, Oak HA, Maple HA, and 37 mm Impact Area are located within the Main Post, between Hospital Road, El Carney Street, and the Nashua River. Figure 20 shows the location of the HAs and 37 mm Impact Area. Historical records indicate that training was conducted within the wooded areas from 1917 until a multifamily housing development was constructed in the late 1950s. A 37 mm range was located along the western boundary of the Grant HA with an approximate 2-acre impact area on the northern slope of Oak Hill.

In 1994 and 1995, the USACE completed a facility-wide archival search to document the locations of all training areas and ranges at Fort Devens. Based on the findings of this study, several former weapons training ranges within the former installation were identified. Several potential munitions and explosives of concern (MEC) sites were identified. The Grant HA, along with portions of the Oak and Maple HAs, were designated as Area 11. A 1995 munitions response investigation confirmed the presence of MEC throughout Area 11, with a clustering of MEC located at the southern end of the area (USACE 1995). In 1996, MEC removal actions were performed at the 37 mm Impact Area, extending into the former Oak and Maple HAs. The removal action is summarized in the Final Removal Action Report (Human Factors Applications, Inc. 1996). All historical removal actions were documented in the Preliminary Assessment/Supplemental Site Inspection Comprehensive Report (Weston 2008).

A ROD (Weston 2009) for the Grant HA and 37 mm Impact Area was signed in 2009. The remedial action objective is to prevent direct contact with UXO, which may remain in the soils at the site. As noted in the ROD (Weston 2009), the LUCs are “preventative for direct contact as they educate the contractor and resident as to the potential presence of UXO and the actions to be taken if presumed UXO is encountered, which included not handling the UXO”. Pursuant to the ROD (Weston 2009), a Land-Use Control Implementation Plan (LUCIP; Army BRAC 2011) was issued in May 2011. LUCs for the Grant HA are addressed through affirmative actions, which include the following:

- Public education to property owners, residents, as well as any construction and/or utility contractors via utility bill inserts, educational materials posted on a community website, and training for contractors conducting ground-intrusive activities on the property.
- A deed notice that will be inserted into any Grant HA deeds by MassDevelopment to convey there is no evidence of additional UXO present at the site, but that the possibility does remain that UXO could be discovered in the future.

Additionally, the LUCIP indicates that LUCs for the 37 mm Impact Area are addressed through institutional controls, access restrictions, affirmative measures, and prohibitive directives including the following:

- Institutional controls to be implemented through a Grant of Environmental Restrictions and Easements.
- Access controls would be implemented using signage and fencing to restrict public access.
- Public education to property owners, residents, as well as any construction and/or utility contractors conducting ground-intrusive activities on the property.
- Prohibitive directives to include restrictions on all ground-intrusive activities.
- Annual site inspections to evaluate the access controls, monitor the potential presence of surficial UXO, and evaluate the overall effectiveness of the LUCs.

The Army conducts annual reviews, including interviews and a physical inspection of the 37 mm Impact Area, to confirm the overall effectiveness and compliance with the established LUCs in the Grant HA and the 37 mm Impact Area. If deemed necessary, the annual review of LUCs at the Grant HA may also include a physical inspection. The annual review of LUCs at the Grant HA also includes verification that the website, utility bill inserts, UXO awareness training, inclusion of the supplemental deed notice in deeds conveying the Grant HA (or portions thereof) and other requirements set forth in the LUCIP (Army BRAC 2011) are being properly implemented.

Separately, the Oak and Maple HAs were evaluated and a Focused Feasibility Study Addendum (Sovereign/HGL 2013) was prepared to address the former Oak and Maple HAs, which recommended LUCs. The remedy for the former Oak and Maple HAs was incorporated within the Grant HA and 37 mm Impact Area via an Explanation of Significant Differences (Sovereign/HGL 2014). The application of LUCs was specified in a Land-Use Control Implementation Plan Addendum (USACE 2021), which was prepared for the Oak and Maple HAs, in addition to a portion of the Grant HA, which was rezoned for commercial uses and is currently owned by Commonwealth Fusion Systems (CFS). The subject area of the LUCIP Addendum (USACE 2021) is collectively referred to as the Restricted Area (Figure 20) and is also known as 111 Hospital Road (CFS-1) and 117 Hospital Road (CFS-2). Additions to the ROD for the Restricted Area include the following:

- The inclusion of a deed notice for the prohibition of residential reuse within the LUCs
- Notice of Activity and Use Limitation (NAUL) to address the potential presence of UXO and other MEC
- LUC affirmative measures for public education
- Construction-related activities, including (but not limited to) the following:
  - Provision of a site-specific soil management plan
  - Provision of UXO/MEC awareness briefing
  - Perform MEC investigation prior to the removal of asphalt roads and/or any intrusive activity beneath existing asphalt roads
  - Conduct instrument-assisted visual inspections of construction areas
  - Provide on-call MEC construction support for all intrusive activities.

The portion of the Grant HA subject to the ROD (Weston 2009) and LUCIP (Army BRAC 2011) is currently zoned for residential reuse per the Devens Reuse Plan (Vanasse Hangen Brustlin, Inc. 1994). MassDevelopment executed and recorded a Grant of Environmental Restrictions and Easements for the Grant HA, which was recorded at the Worcester Registry of Deeds on December 19, 2011 (book 48291, page 138).

The Restricted Area (comprising the Oak HA, Maple HA, and remaining portion of the Grant HA) subject to the LUCIP Addendum (USACE 2021) is currently zoned for commercial construction. MassDevelopment executed and recorded a NAUL, which was recorded at the Worcester Registry of Deeds on April 27, 2021, book 65027, page 30. The 37 mm Impact Area continues to be fenced off and restricted from any land use other than utility repair or emergency work.

7.2 Land-Use Controls

The annual LUC checklist (Appendix G) was completed for the former HAs and 37 mm Impact Area, including physical on-site inspections (if deemed necessary) and interviews. An interview was conducted with Anne-Marie Dowd (MassDevelopment), Neil Angus (Devens Enterprise Commission), Rich Holcomb (Commonwealth Fusion

Systems), and Kathleen Brill (Foley Hoag LLP) on January 29, 2024, to discuss compliance with the LUCs. The following items were evaluated:

- Discuss any reports during the reporting year of any objects discovered on site, including any findings of UXO.
- Describe any ground-intrusive activities conducted during the reporting year.
- Verify the existence of an educational website for the public.
- Verify the inclusion of required utility bill inserts.
- Verify the posting of utility bill insert in a conspicuous location.
- Verify distribution of the current soils management policy to construction workers and contractors.
- Verify that UXO awareness training is being conducted (if construction activities occurred during the reporting year).
- Verify that the supplemental deed notice has been included in deeds conveying of the Grant HA.
- Verify if any amendments to the NAUL were recorded/executed for the Restricted Area.

7.2.1 37-Millimeter Impact Area

In the 37 mm Impact Area, LUCs were verified during a site visit on November 27, 2023. The inspection was performed to identify land-use conditions (fencing, signage, and vegetation), any areas of UXO concern, (performed by sweeping 10% of the site with a metal detector), and any evidence of site use changes. The fence around the 37 mm Impact Area was inspected for damage and a metal detector was used to sweep the ground. No UXO was detected, and metal detector findings were limited to other metallic objects. The access gates and signage were observed to be in good condition, except for a small area of fence that was damaged by a fallen tree; the fence will be scheduled for repair in 2024. Overall, the findings of the site inspection revealed no abnormalities.

7.2.2 Restricted Area

In the Restricted Area (former Oak and Maple HA, portion of the former Grant HA), construction activities continued on the CFS manufacturing and research facility. CFS submitted a Completion Summary Report to MassDevelopment and the USEPA on March 25, 2022, which summarized MEC construction support work completed from May through December 2021; a copy of the Completion Report was included in the 2021 Annual Report (S-A JV 2022b). In 2023, construction activities were limited to work on utility buildings; no soil management activities were completed, no site walks or physical inspections were required by MassDevelopment or the Devens Enterprise Commission, and no UXOs were encountered.

7.2.3 Unrestricted/Residential Use Area

In the unrestricted/residential use area (portion of the former Grant HA), no residential construction work was completed in 2023. The Supplemental Deed Notice was included in deeds conveying portions of the unrestricted/residential use area, in accordance with the LUC provisions. Appendix F contains copies of the deed notice and utility bill insert. In addition, all contractors are provided with copies of the Devens Soil Management Policy and are required to implement all requirements within the documents. No UXOs were encountered in the unrestricted/residential use area.

7.3 Conclusions and Recommendations

The remedial action objective for the HAs and the 37 mm Impact Area is to prevent direct contact with UXOs that may remain at the site(s). During the 2023 review period, the former Grant, Oak, and Maple HAs, and the 37 mm Impact Area were subject to annual LUC interviews, on-site inspections, as well as other affirmative measures and prohibitive directives (e.g., distribution of educational materials, providing awareness courses for site workers and residents, implementing deed notices, and maintaining signage). Results of the annual compliance monitoring indicate that no deviations or deficiencies to the LUCs were evident and corrective action(s) were not necessary. No UXO was discovered on site during 2023. Proper signage remains in place and all contractors are required to attend pre-construction meetings where UXO awareness information is presented. Copies of the Soils Management Plan (residential reuse portion of the Grant HA), Site-Specific Soils Management Plan (Restricted Area), and UXO information are available on the Devens Enterprise Commission website (www.devensec.com).

The following recommendations are included for the HAs and 37 mm Impact Area:

- Continue annual LUC inspections (including physical inspection for UXOs in the Impact Area) in accordance with the LUCIP.
- Complete repairs to Impact Area fence and replace locks on Impact Area gates so they are standardized to the same key.

8 Areas of Contamination 44 and 52

The S-A JV developed a LUCIP in September 2023 (S-A JV, 2023d) to guide the implementation of stand-alone LUCs for the Barnum Road Maintenance Yards (AOCs 44 and 52; Figure 21). AOCs 44 and 52 were remediated in 1996 and LUCs were selected as a component of the remedy. A summary of the site background and LUCs are included below and will be included in subsequent annual LTM reports for Main Post sites.

8.1 Site Background

The Barnum Road Maintenance Yards were historically used for Army vehicle storage. AOC 44 was known as the Cannibalization Yard where vehicles were stored prior to being dismantled for usable parts. AOC 52 was a Table of Distribution and Allowance Maintenance Yard where vehicles were stored awaiting repairs. Soils in AOCs 44 and 52 have been exposed to possible releases of automotive fluids over a long duration. These fluids likely include gasoline, motor oil, and other automotive fluids released during vehicle storage or during vehicle dismantling operations in the Cannibalization Yard. Individual releases are not likely to have been of significant volume, but numerous releases during the period in which the yard had been used account for the historical soil contamination.

The ROD for AOCs 44 and 52 (March 1995) set forth the selected remedy to address contaminated soils associated with two known releases (hot spot areas) at the site (USAEC 1995). To achieve specified remedial action objectives specified in the ROD, the remedy selected to address the contamination identified at AOCs 44 and 52 included soil excavation, asphalt batching of soils which exceed site cleanup levels, expansion of the existing stormwater collection system, and deed restrictions.

8.2 Land-Use Controls, Interviews, and Inspection

AOCs 44 and 52 are currently under Army ownership. Per the ROD (USAEC 1995), substantive requirements of LUCs that restrict access to contaminated soil are in place at AOCs 44 and 52. The LUCs were designed to protect the integrity and effectiveness of the remedy. Any proposed actions that affect the AOC 44 and 52 property must meet the following requirements of the ROD (USAEC 1995):

- Residential development/use of the Maintenance Yards is prohibited,
- The possibility of long-term (working lifetime) exposure to subsurface soils must be minimized, and
- Soils resulting from construction related activities must be managed.

An annual LUC inspection was performed on November 28, 2023, which confirmed the following (Appendix F):

- A new gas line was observed to be installed in the eastern part of the property; the current line was replaced with a smaller line due to safety concerns as the line had too much pressure. The S-A JV worked with the Army, MassDevelopment, and the gas provider (National Grid) to obtain additional details on the trenching work. According to the Army 99th division representative and National Grid, no soil was excavated or taken offsite, and no work was conducted below the top 2 feet of soil.
- No evidence of development or damage in the area of the remedy. The asphalt cover was observed to be intact, with no evidence of erosion.
- The access is sufficient to the site for monitoring.
- No signs of increased exposure potential.

A phone interview was conducted with Army personnel associated with the facility (Daniel O'Leary, Christopher Hastings, and Michael King) on January 19, 2024, which confirmed the following (Appendix F):

- The interviewee is familiar with the LUCs imposed on the property and documentation of these controls.
- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.
- The planned gas line installation work involved trenching/excavations. As mentioned above, the S-A JV confirmed that no trenching work extended to soils below two feet in depth.
- No issues with site access for monitoring.

The following recommendations are included for AOCs 44 and 52:

- Continue annual LUC inspections in accordance with the LUCIP.

9 Study Area 71

The S-A JV developed a LUCIP in September 2023 (S-A JV, 2023e) to guide the implementation of stand-alone LUCs for the Former Railroad Roundhouse Study Area (SA) 71 (Figure 22). SA 71 has been remediated in 2014 and LUCs were selected as a component of the remedy. A summary of the site background and LUCs are included below and will be included in subsequent annual LTM reports for Main Post sites.

9.1 Site Background

SA 71 is the location of a former railroad roundhouse operated by Boston & Maine Railroad. From 1993 to 1994, the Army conducted site investigations near the former railroad roundhouse (ABB Environmental Services, Inc. [ABB-ES] 1993, 1995). Data gathered during the investigations indicated the widespread presence of coal ash and maintenance byproducts in surface and deeper soil across much of SA 71. High concentrations of inorganic analytes, in particular antimony, copper, and lead, were identified in the observed maintenance byproduct. A removal action was conducted at SA 71 in 1999-2000 and resulted in the removal of approximately 2,400 cubic yards of metals-contaminated soil. In 2013, a second removal action was completed to excavate approximately 900 cubic yards of maintenance by-product below the water line at the southern shoreline of the former railroad roundhouse area. A ROD was issued in September 2015 for AOC 72 and SA 71 (Sovereign 2015).

9.2 Land-Use Controls, Interviews, and Inspection

To mitigate any potential risk to health and welfare from exposure to debris and residual soil contamination associated with activities in the upland area of the former railroad roundhouse, LUCs were selected as the remedy in the ROD for SA 71 (Sovereign 2015). The ROD specified that the LUCs would be addressed through institutional controls, affirmative measures, and prohibitive directives with the objective of limited potential exposure (Sovereign 2015). SA 71 is owned by the Army but is leased to MassDevelopment per a Lease in Furtherance of Conveyance agreement. Under the Lease in Furtherance of Conveyance agreement, MassDevelopment must comply with the LUCs of the ROD (Sovereign 2015) to limit the potential exposure to the residual contaminated soil under both existing and future site conditions. The site-specific annual LUC checklist, including physical on-site inspection and interview components, was developed in 2023 (as part of the LUCIP submittal) for use during LUC verification activities to ensure control requirements are being met. Appendix F contains the completed checklist.

An annual LUC inspection was performed on November 28, 2023, which confirmed the following (Appendix F):

- No evidence of excavation in the Site-Specific Soil Management Area.
- No evidence of damage to the property.
- No groundwater extraction wells present.
- No signs of development on the property.
- No change in the current use of the property.
- The access is sufficient to the site for monitoring. The gate leading to Plow Shop Pond was observed to need a new chain and lock.
- No signs of increased exposure potential.

The S-A JV and Army conducted an interview on January 29, 2024, with Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), and Meg Delorier (MassDevelopment) which confirmed the following (Appendix F):

- The interviewee is familiar with the LUCs imposed on the property and documentation of these controls.
- No extractions wells at the property.
- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.
- No excavations (planned or emergency) were completed that may have extended into the soil surface within the soil disturbance restriction boundary.
- No issues with site access for monitoring.

The following recommendations are included for SA 71:

- Continue annual LUC inspections in accordance with the LUCIP.
- Replace the chain and lock on the gate leading to Plow Shop Pond.

10 References

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Tables

Table 1
Groundwater Elevations Spring 2023 LTM Event
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site Name	Well Identification[1]	Well Type	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
DCL	LFM-03-07	overburden	06/07/2023	19.63	315.14	295.51
	LFM-99-01B	bedrock	06/07/2023	25.30	350.67	325.37
	LFM-99-02B	bedrock	06/07/2023	18.45	353.83	335.38
	LFM-99-03B	bedrock	06/07/2023	40.87	342.08	301.21
	LFM-99-05A	overburden	06/07/2023	22.71	316.58	293.87
	LFM-99-05B	bedrock	06/07/2023	19.94	316.58	296.64
	LFM-99-06ARP	overburden	06/08/2023	15.71	337.84	322.13
AOC 57	57M-03-01X	overburden	06/07/2023	14.57	235.73	221.16
	57M-03-02X	overburden	06/07/2023	5.32	224.84	219.52
	57M-03-03X	overburden	06/07/2023	1.31	220.00	218.69
	57M-03-04X	overburden	06/07/2023	2.52	221.39	218.87
	57M-03-05X	overburden	06/07/2023	2.98	221.88	218.90
	57M-03-06X	overburden	06/07/2023	2.78	221.87	219.09
	57M-95-03X	overburden	06/07/2023	11.17	232.79	221.62
	57M-95-05X	overburden	06/07/2023	14.71	235.15	220.44
	57M-95-06X	overburden	06/07/2023	12.99	234.39	221.40
	57M-95-07X	overburden	06/07/2023	3.20	222.36	219.16
	57M-96-10X	overburden	06/07/2023	7.15	228.75	221.60
	57M-96-11X	overburden	06/07/2023	3.40	222.20	218.80
	57M-96-12X	overburden	06/07/2023	5.08	225.80	220.72
	57M-96-13X	overburden	06/07/2023	4.97	225.58	220.61
	57P-98-03X	overburden	06/07/2023	2.54	220.39	217.85
	57P-98-04X	overburden	06/07/2023	3.32	221.75	218.43
	57WP-05-01	overburden	06/07/2023	2.01	221.71	219.70
	57WP-06-02	overburden	06/07/2023	1.42	220.29	218.87
	57WP-06-03	overburden	06/07/2023	0.80	220.51	219.71
AOC 32/43A	32M-01-13XBR	bedrock	06/07/2023	17.80	257.88	240.08
	32M-01-14XBR	bedrock	06/08/2023	22.42	256.06	233.64
	32M-01-14XOB	overburden	06/08/2023	24.43	256.56	232.13
	32M-01-15XBR	bedrock	06/07/2023	20.60	258.36	237.76
	32M-01-16XBR	bedrock	06/07/2023	22.75	257.50	234.75
	32M-01-17XBR	bedrock	06/07/2023	25.11	259.11	234.00
	32M-01-18XBR	bedrock	06/07/2023	17.10	258.32	241.22
	32M-92-01X	overburden	06/08/2023	17.53	260.17	242.64
	32M-92-03X	overburden	06/07/2023	27.65	260.02	232.37
	32Z-01-05XOB	overburden	06/07/2023	28.72	261.40	232.68
	32Z-01-06XBR	bedrock	06/08/2023	16.49	261.85	245.36
	32Z-01-07XOB	overburden	06/08/2023	15.92	259.48	243.56
	32Z-01-08XOB	overburden	06/07/2023	18.10	260.49	242.39
	32Z-01-09XOB	overburden	06/07/2023	25.76	257.37	231.61
	32Z-01-10XBR	bedrock	06/07/2023	17.01	257.41	240.40
	32Z-01-11XBR	bedrock	06/07/2023	DRY	261.50	DRY
	32Z-01-12XBR	bedrock	06/07/2023	19.24	257.85	238.61
	32Z-99-02X	overburden	06/07/2023	19.20	259.71	240.51
	43M-01-16XBR	bedrock	06/07/2023	24.42	256.84	232.42
	43M-01-16XOB	overburden	06/07/2023	24.41	256.88	232.47
	43M-01-17XBR	bedrock	06/07/2023	26.16	258.29	232.13
	43M-01-17XOB	overburden	06/07/2023	26.01	258.08	232.07
	43M-01-20XBR	bedrock	06/07/2023	25.69	257.30	231.61
	43M-01-20XOB	overburden	06/07/2023	25.84	257.40	231.56

Table 1
Groundwater Elevations Spring 2023 LTM Event
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site Name	Well Identification[1]	Well Type	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
AOC 32/43A (cont.)	SHL-15	overburden	06/08/2023	17.62	258.83	241.21
	SHL-25	overburden	06/07/2023	26.21	258.01	231.80

Acronyms and Abbreviations:
AOC = Area of Contamination
DCL = Devens Consolidation Landfill
DTW = depth to water
ft = feet
LTM = long-term monitoring
MPE = measuring point elevation
NAVD88 = North American Vertical Datum of 1988

Table 2
Groundwater Elevations Fall 2023 LTM Event
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site Name	Well Identification	Well Type	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
AOC 43G	AAFES-2	hybrid	11/6/2023	22.99	301.72	278.73
	AAFES-5	overburden	11/6/2023	22.18	299.80	277.62
	AAFES-6R	overburden	11/6/2023	20.39	298.74	278.35
	AAFES-7	overburden	11/6/2023	8.21	258.80	250.59
	XGM-93-02X	hybrid	11/6/2023	28.78	309.01	280.23
	XGM-94-04X	bedrock	11/6/2023	19.45	300.69	281.24
	XGM-94-06X	hybrid	11/6/2023	21.56	284.07	262.51
	XGM-94-07X	hybrid	11/6/2023	21.89	294.82	272.93
	XGM-94-08X	hybrid	11/6/2023	26.35	298.98	272.63
	XGM-94-10X	overburden	11/6/2023	25.25	301.96	276.71
	XGM-97-12X	hybrid	11/6/2023	25.18	308.70	283.52
DCL	LFM-03-07	overburden	11/3/2023	18.95	315.14	296.19
	LFM-99-01B	bedrock	11/3/2023	25.85	350.67	324.82
	LFM-99-02B	bedrock	11/3/2023	18.11	353.83	335.72
	LFM-99-03B	bedrock	11/3/2023	40.06	342.08	302.02
	LFM-99-05A	overburden	11/3/2023	22.2	316.58	294.38
	LFM-99-05B	bedrock	11/3/2023	19.28	316.58	297.30
	LFM-99-06A-RP	overburden	11/3/2023	15.54	337.84	322.30
AOC 69W	69W-94-12	overburden	11/2/2023	5.96	228.14	222.18
	69W-94-13	overburden	11/2/2023	4.87	226.99	222.12
	69W-94-14	overburden	11/2/2023	5.98	227.22	221.24
	69WP-08-01	overburden	11/2/2023	1.83	220.52	218.69
	69WP-13-01	overburden	11/2/2023	1.30	218.59	217.29
	Willow Brook PZ	overburden	11/2/2023	1.68	218.17	216.49
	ZWM-01-25X	overburden	11/2/2023	4.24	224.71	220.47
	ZWM-01-26X	overburden	11/2/2023	5.87	226.81	220.94
	ZWM-95-15X	overburden	11/2/2023	3.97	225.01	221.04
	ZWM-95-16X	overburden	11/2/2023	3.91	227.58	223.67
	ZWM-95-17X	overburden	11/2/2023	12.92	237.83	224.91
	ZWM-95-18X	overburden	11/2/2023	2.47	222.15	219.68
	ZWM-99-22X	overburden	11/2/2023	3.95	226.72	222.77
	ZWM-99-23X	overburden	11/2/2023	3.91	225.08	221.17
	ZWM-99-24X	overburden	11/2/2023	4.02	225.85	221.83
	ZWP-95-01X	overburden	11/2/2023	4.18	226.04	221.86
	ZWP-95-02X	overburden	11/2/2023	2.91	222.83	219.92

Acronyms and Abbreviations:
AOC = Area of Contamination
DCL = Devens Consolidation Landfill
DTW = depth to water
ft = feet
LTM = long-term monitoring
MPE = measuring point elevation
NAVD88 = North American Vertical Datum of 1988

Table 3
Monthly Precipitation Data
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Month	Year																				Average
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
January	0.75	3.46	4.58	2.72	2.38	2.49	3.31	3.66	2.18	1.38	2.18	2.73	1.48	3.00	2.19	3.40	1.68	2.48	2.28	5.40	**2.69**
February	1.32	2.17	2.28	1.21	8.85	2.51	6.05	4.11	1.12	2.91	3.16	0.55	3.36	2.34	3.07	3.00	3.05	2.22	4.91	1.53	**2.99**
March	2.97	4.08	0.53	3.97	5.28	2.40	10.61	4.08	1.25	2.31	4.16	1.03	3.12	3.86	2.88	1.95	3.34	1.72	2.71	4.26	**3.33**
April	7.67	5.47	2.21	7.09	3.61	4.00	1.43	5.05	2.87	1.62	3.25	0.33	1.89	4.85	5.25	6.72	5.40	4.22	3.72	4.21	**4.04**
May	3.43	4.25	7.32	4.37	1.99	3.97	3.37	3.81	3.13	5.38	3.29	0.10	2.04	6.21	1.61	3.12	1.85	4.22	1.71	2.72	**3.39**
June	1.67	3.87	9.31	1.56	4.02	6.41	3.53	5.69	4.03	8.53	1.76	2.76	1.04	3.97	4.71	5.56	1.93	0.88	2.16	5.04	**3.92**
July	4.72	1.67	1.71	6.25	6.35	9.61	4.01	2.27	1.46	3.46	4.10	1.73	1.92	3.37	3.49	3.64	2.94	8.24	1.72	11.80	**4.22**
August	2.77	2.56	4.38	1.40	4.66	2.64	3.58	10.99	4.92	2.09	2.25	1.17	2.55	1.83	10.10	4.00	1.15	4.04	1.28	5.15	**3.68**
September	7.35	1.67	2.87	2.25	8.05	1.28	2.48	6.94	3.06	1.64	1.07	3.23	0.05	4.54	7.79	0.48	1.23	5.82	4.75	12.22	**3.94**
October	1.91	13.46	6.10	3.35	1.81	3.99	6.17	7.12	5.12	1.28	5.22	3.60	4.58	9.12	4.12	6.01	4.18	3.39	4.55	3.15	**4.91**
November	3.42	4.40	6.38	2.67	3.66	3.43	3.92	3.94	0.47	2.66	3.60	1.66	3.27	1.22	8.81	0.62	4.67	2.05	3.38	1.72	**3.30**
December	3.89	3.79	1.77	3.67	3.78	3.69	4.08	4.84	3.39	3.46	4.44	2.10	3.40	2.50	3.61	0.28	5.15	3.12	6.44	3.64	**3.55**
TOTAL	**41.87**	**50.85**	**49.44**	**40.51**	**54.44**	**46.42**	**52.54**	**62.50**	**33.00**	**36.72**	**38.48**	**20.99**	**28.70**	**46.81**	**57.63**	**38.78**	**36.57**	**42.40**	**39.61**	**60.84**	**43.96**

Notes:
Monthly data retrieved from the National Oceanic and Atmospheric Administration (NOAA) data inventory (https://www.ncdc.noaa.gov/cdo-web/datasets/LCD/stations/WBAN:04780/detail)
Values given in total inches of precipitation per month
Source Location: Fitchburg Municipal Airport, Massachusetts Weather Station

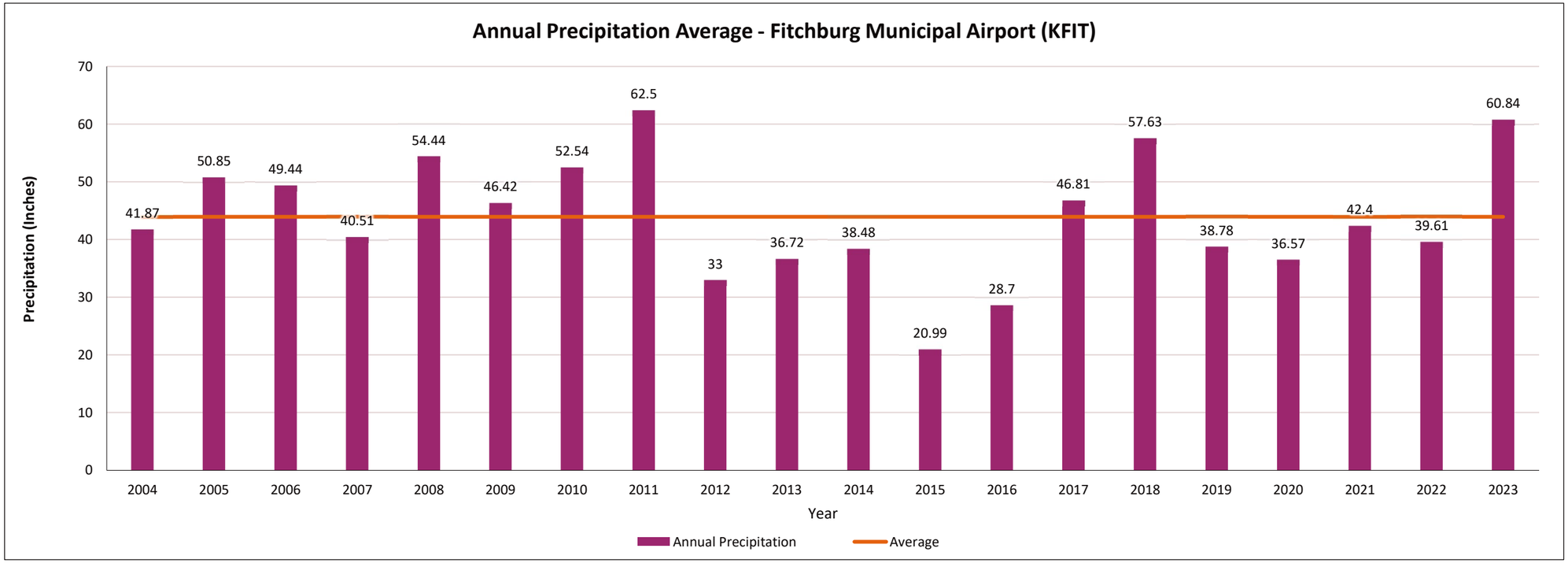

Table 4
Analytical Methods, Containers, Holding Times, and Preservatives
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site/Events	Parameter	Analytical Method[1]	Target Analytes	Sample Container[2]	Preservative	Holding Time
AOC 57 (Spring)	Dissolved Metals*	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
	Total Metals	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
AOC 32/43A (Spring)	VOCs	SW8260B	TAL	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	Total Metals	SW6010C/6020A	As, Mn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
AOC 69W (Fall)	EPH	MADEP-EPH-04-1.1	EPH	2 x 1-Liter Glass Amber with Teflon- lined lid	HCl to pH < 2; 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Dissolved Metals*	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
AOC 43G (Fall)	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	Total Metals	SW6010C	Fe, Mn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
	Alkalinity	SM2320B	None	1 x 250-ml Polyethylene	Store at 4°± 2°C	14 Days
DCL (GW) (Spring/Fall)	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	EPH	MADEP-EPH-04-1.1	EPH	2 x 1-Liter Glass Amber with Teflon- lined lid	HCl to pH < 2; 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Pesticides	SW8081A	TAL	2 x 1-Liter Glass Amber with Teflon- lined lid	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Select Metals (Total)	SW6010C/6020A	Select Metals for DCL Groundwater: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
	Mercury	SW7470A	Hg			28 days
	Cyanide (Total)	SW9012B	Cyanide (Total)	1 x 250-ml Polyethylene	NAOH to pH > 12; 4°± 2°C	14 Days
	TDS	SM2540C-11	None	1 x 500-ml Polyethylene	Store at 4°± 2°C	7 days
	Anions	SW9056A	Chloride, Sulfate	1 x 125-ml Polyethylene	Store at 4°± 2°C	28 days
	Alkalinity	SM2320B	None	1 x 250-ml Polyethylene	Store at 4°± 2°C	14 Days
DCL (GW) (Spring/Fall, cont.)	COD	410.4	None	1 x 250-ml Polyethylene	H_2SO_4 to pH < 2; 4°± 2°C	28 Days
	Nitrate/Nitrite as N	E353.2	Nitrate/Nitrite as N	1 x 500-ml Polyethylene	H_2SO_4 to pH < 2; 4°± 2°C	28 Days
DCL (Leachate) (Fall)	Select Metals (Total)	SW6010C/6020A	Select Metals for DCL Leachate: Al, As, Cd, Cr, Cu, Pb, Ni, Ag, Zn	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	180 Days
	Mercury	SW7470A	Hg	1 x 250-ml Polyethylene	HNO_3 to pH < 2; 4°± 2°C	28 days
	Cyanide (Total)	SW9012B	Cyanide (Total)	1 x 250-ml Polyethylene	NAOH to pH > 12; 4°± 2°C	14 Days
	TSS/pH	SM2540D/SW9040C		1 x 1-liter Polyethylene	Store at 4°± 2°C	7 days
	TPH as DRO	SW8015B	DRO	2 x 1-Liter Glass Amber with Teflon- lined lid	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Total Phenolics	SW9065	Total Phenols	1 x 250-ml amber	H_2SO_4 to pH < 2; 4°± 2°C	28 days
	TTO (VOCs)	624.00	VOCs	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	TTO (SVOCs)	625.00	SVOCs	2 x 1-liter amber	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	TTO (Pesticides/ PCBs)	SW8081B/8082A	Pesticides/PCBs	2 x 1-liter amber	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)

Notes:
* Samples submitted for dissolved metals are field filtered.
[1] "Methods for Chemical Analysis of Water and Wastes", Cincinnati, OH, March 1979, EPA 600-4-79-020.
"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods", EPA SW-846, Update 8, 2014.
[2] Additional sample containers/volumes are required for matrix quality control samples.

Acronyms and Abbreviations:
°C = degrees Celsius
AOC = Area of Contamination
BTEX = benzene, toluene, ethylbenzene, and xylenes
COD = chemical oxygen demand
DCL = Devens Consolidation Landfill
DRO = diesel-range organics
EPA = United States Environmental Protection Agency
EPH = extractable petroleum hydrocarbon
GW = groundwater
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
TAL = Target Analyte List
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
TSS = total suspended solids
TTO = total toxic organics
VOC = volatile organic compound
VPH = volatile petroleum hydrocarbon

Table 5
Monitoring Wells and Surface Water Locations Selected for Long-Term Monitoring
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Location ID	Ground Surface Elevation	Top of Casing Elevation	Top of Screen Interval	Bottom of Screen Interval	Top of Screen Interval	Bottom of Screen Interval
	(ft NAVD88)	(ft NAVD88)	(ft BGS)	(ft BGS)	(ft NAVD88)	(ft NAVD88)
AOC 57 (Annual Sampling)						
57-SW-1	--	--	--	--	--	--
57M-03-01X	234.44	235.73	10	20	224.44	214.44
57M-03-02X	222.99	224.84	2	12	220.99	210.99
57M-03-03X	218.98	220.00	2	12	216.98	206.98
57M-03-04X	219.46	221.39	2	12	217.46	207.46
57M-03-05X	219.58	221.88	2	12	217.58	207.58
57M-03-06X	220.25	221.87	2	12	218.25	208.25
57M-95-03X	230.80	232.79	7	17	223.80	213.80
57M-95-05X	232.99	235.15	10	20	222.99	212.99
57M-95-06X	232.63	234.39	12	22	220.77	210.77
57M-95-07X	221.50	222.36	3	13	218.50	208.50
57M-96-10X	226.29	228.75	3	13	223.29	213.29
57M-96-11X	220.04	222.20	2	12	218.04	208.04
57M-96-12X	222.78	225.80	2	12	220.78	210.78
57M-96-13X	223.23	225.58	2	12	221.23	211.23
57P-98-03X	218.62	220.39	2.5	5.5	216.12	213.12
57P-98-04X	218.24	221.75	2	5	216.24	213.24
57WP-05-01	219.34	221.71	0	2	219.34	217.34
57WP-06-02	219.17	220.29	18.92	23.92	200.25	195.25
57WP-06-03	219.31	220.51	13.85	18.85	205.46	200.46
AOC 69W (Annual Sampling)						
69W-94-12	225.65	228.14	3	13	222.65	212.65
69W-94-13	224.50	226.99	3	13	221.50	211.50
69W-94-14	224.73	227.22	3	13	221.73	211.73
69WP-08-01	219.17	220.52	10*	13*	209.17	206.17
69WP-13-01	217.43	218.59	10*	13*	207.43	204.43
ZWM-01-25X	222.58	224.71	6.13	16.13	216.45	206.45
ZWM-01-26X	224.36	226.81	6.45	16.45	217.91	207.91
ZWM-95-15X	222.14	225.01	5.87	15.87	216.27	206.27
ZWM-95-16X	228.21	227.58	5.67	15.67	222.54	212.54
ZWM-95-17X	235.27	237.83	14.76	24.76	220.51	210.51
ZWM-95-18X	219.93	222.15	5.22	15.22	214.71	204.71
ZWM-99-22X	226.89	226.72	4.6	14.6	222.29	212.29
ZWM-99-23X	223.40	225.08	4.68	14.68	218.72	208.72
ZWM-99-24X	222.83	225.85	5.52	15.52	217.31	207.31
ZWP-95-01X	223.63	226.04	10	12	213.63	211.63
ZWP-95-02X	219.91	222.83	9.5	11.5	210.41	208.41
Willow Brook Piezometer	216.80	218.17	--	--	--	--
AOC 43G (Annual Sampling)						
AAFES-2	299.47	301.72	16.2	31.2	283.27	268.27
AAFES-5	300.01	299.80	15.5	30.5	284.51	269.51
AAFES-6R	296.77	298.74	15	25	281.77	271.77
AAFES-7	256.10	258.80	4.5	14.5	251.60	241.60
XGM-93-02X	309.40	309.01	28	38	281.40	271.40
XGM-94-04X	298.30	300.69	18.2	28.2	280.10	270.10
XGM-94-06X	281.40	284.07	17	27	264.40	254.40
XGM-94-07X	292.20	294.82	17	27	275.20	265.20
XGM-94-08X	296.40	298.98	23.5	33.5	272.90	262.90
XGM-94-10X	299.60	301.96	21.5	31.5	278.10	268.10
XGM-97-12X	309.26	308.70	24	34	285.26	275.26
AOCs 32/43A (Annual Sampling)						
32M-01-13XBR	228.30	257.88	13.7	23.7	244.60	234.60
32M-01-14XBR	254.11	256.06	35.8	45.8	220.30	210.30
32M-01-14XOB	254.30	256.56	17.3	27.3	237.10	227.10
32M-01-15XBR	257.90	258.36	34.5	44.5	223.40	213.40
32M-01-16XBR	257.70	257.50	21	31	236.70	226.70
32M-01-17XBR	256.85	259.11	41.4	51.4	217.71	207.71
32M-01-18XBR	258.61	258.32	14	24	244.60	234.60
32M-92-01X	258.26	260.17	13	23	243.90	233.90
32M-92-03X	258.23	260.02	23.2	33.2	235.00	225.00
32Z-01-05XOB	260.95	261.40	25.5	35.5	235.90	225.90
32Z-01-06XBR	259.82	261.85	16.7	26.7	243.30	233.30
32Z-01-07XOB	257.68	259.48	12.7	22.7	244.98	236.78
32Z-01-08XOB	258.59	260.49	12	22	246.59	238.49
32Z-01-09XOB	257.80	257.37	23.5	33.5	234.30	223.87
32Z-01-10XBR	257.76	257.41	12.5	22.5	245.26	234.91
32Z-01-11XBR	262.07	261.50	8.4	18.4	253.65	243.08
32Z-01-12XBR	258.24	257.85	27.8	37.8	230.46	220.07
32Z-99-02X	257.48	259.71	14.5	29.5	242.98	230.21
43M-01-16XBR	257.04	256.84	47.5	57.5	209.54	199.34
43M-01-16XOB	257.11	256.88	24	34	233.11	222.88

Table 5
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Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Location ID	Ground Surface Elevation	Top of Casing Elevation	Top of Screen Interval	Bottom of Screen Interval	Top of Screen Interval	Bottom of Screen Interval
	(ft NAVD88)	(ft NAVD88)	(ft BGS)	(ft BGS)	(ft NAVD88)	(ft NAVD88)
43M-01-17XBR	258.53	258.29	47.5	57.5	211.03	200.79
43M-01-17XOB	258.51	258.08	23.5	33.5	235.01	224.58
43M-01-20XBR	257.78	257.30	68.3	78.3	189.48	179.00
43M-01-20XOB	257.78	257.40	24	34	233.78	223.40
SHL-15	258.83	258.83	14	24	244.83	234.83
SHL-25	256.28	258.01	23.5	33.5	232.78	224.51
DCL (Semi-Annual Sampling)						
LFM-03-07	315.68	315.14	10.9	20.9	304.78	294.24
LFM-99-01B	326.20	350.67	23.3	32.6	302.90	318.07
LFM-99-02B	353.03	353.83	14.5	23.8	338.53	330.03
LFM-99-03B	341.28	342.08	38.2	47.5	303.08	294.58
LFM-99-05A	315.78	316.58	19.0	28.3	296.78	288.28
LFM-99-05B	315.78	316.58	51.5	55.8	264.28	260.78
LFM-99-06ARP	335.21	337.84	17.5	32.5	317.71	305.34

Notes:
* = Ground surface estimated based on field measurement of stickup casing.

Acronyms and Abbreviations:
AOC = Area of Contamination
DCL = Devens Consolidation Landfill
ft = feet
ft BGS = feet below ground surface

Table 6
AOC-Specific Action Levels
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Chemical of Concern	MCP GW-1[1] (µg/L)	Background[2] (µg/L)	MCL[3] (µg/L)	Cleanup Goal[4] (µg/L)	Monitoring Criteria[4] (µg/L)	Surface Water Benchmark[5] (µg/L)
AOC 57 Area 3 - Building 3713 Fuel Oil Spill Site						
Arsenic, Total	10	10.5	10	10	NS	NS
Arsenic, Dissolved	NS	NS	NS	NS	NS	150
Iron, Dissolved	NS	NS	NS	NS	NS	1,000
AOC 69W - Fort Devens Elementary School Fuel Oil Spill Site						
Arsenic, Dissolved	10	10.5	10	10	NS	NS
Iron, Dissolved	NS	9,100	NS	NS	9,100	NS
Manganese, Dissolved	NS	291	NS	NS	291	NS
EPH[5]						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	14,000	NS	NS	NS	14,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
AOC 43G - Historical Gas Station Motor Pool Fueling Station Site						
Iron, Total	NS	9,100	NS	9,100	NS	NS
Manganese, Total	NS	291	NS	375[7]	NS	NS
VOCs						
Benzene	5.0	ND	5.0	5.0	NS	NS
Toluene	1,000	ND	1,000	1,000	NS	NS
Ethylbenzene	700	ND	700	700	NS	NS
Xylenes, Total	10,000	ND	10,000	10,000	NS	NS
VPH[5]						
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
AOCs 32/43A - Former POL Storage Area						
Arsenic, Total	10	10.5	10	10	NS	NS
Manganese, Total	NS	3,500	NS	3,500	NS	NS
VOCs						
Chlorobenzene	100	NS	100	NS	100	NS
Vinyl Chloride	2.0	NS	2.0	2.0	NS	NS
1,2-dichloroethene (trans)	100	NS	100	100	NS	NS
1,2-dichloroethene (cis)	55	NS	70	55	NS	NS
1,1,1-trichloroethane	200	NS	200	NS	5.0	NS
Trichloroethene	5.0	NS	5.0	5.0	NS	NS
1,2-dichlorobenzene	600	NS	600	600	NS	NS
1,3-dichlorobenzene	100	NS	NS	600	NS	NS
1,4-dichlorobenzene	5.0	NS	75	5.0	NS	NS
VPH[5]						
Benzene	5.0	NS	5.0	NS	5.0	NS
Ethylbenzene	700	NS	700	NS	700	NS
Xylenes, total	10,000	NS	10,000	NS	10,000	NS
Toluene	1,000	NS	1,000	NS	1,000	NS
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
EPH[5]						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	14,000	NS	NS	NS	5,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Devens Consolidation Landfill (DCL) - Landfilling Waste From SAs and AOCs						
VPH[5]						
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Methyl tert-butyl ether	70	NS	NS	NS	70	NS
Benzene	5.0	NS	5.0	NS	5.0	NS
Toluene	1,000	NS	1,000	NS	1,000	NS
Ethylbenzene	700	NS	700	NS	700	NS
Xylenes, total	10,000	NS	10,000	NS	10,000	NS
Naphthalene	140	NS	NS	NS	140	NS
EPH[6]						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	5,000	NS	NS	NS	5,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Target PAH Analytes						
2-Methylnaphthalene	10	NS	NS	NS	10	NS
Acenaphthene	20	NS	NS	NS	20	NS
Acenaphthylene	30	NS	NS	NS	30	NS
Anthracene	60	NS	NS	NS	60	NS
Benzo(a)anthracene	1.0	NS	NS	NS	1.0	NS
Benzo(a)pyrene	0.20	NS	0.2	NS	0.2	NS
Benzo(b)fluoranthene	1.0	NS	NS	NS	1.0	NS
Benzo(g,h,i)perylene	50	NS	NS	NS	50	NS
Benzo(k)fluoranthene	1.0	NS	NS	NS	1.0	NS
Chrysene	2.0	NS	NS	NS	2.0	NS

Table 6
AOC-Specific Action Levels
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Chemical of Concern	MCP GW-1[1] (µg/L)	Background[2] (µg/L)	MCL[3] (µg/L)	Cleanup Goal[4] (µg/L)	Monitoring Criteria[4] (µg/L)	Surface Water Benchmark[5] (µg/L)
Dibenzo(a,h)anthracene	0.50	NS	NS	NS	0.50	NS
Fluoranthene	90	NS	NS	NS	90	NS
Fluorene	30	NS	NS	NS	30	NS
Indeno(1,2,3-cd)pyrene	0.50	NS	NS	NS	0.50	NS
Naphthalene	140	NS	NS	NS	140	NS
Phenanthrene	40	NS	NS	NS	40	NS
Pyrene	60	NS	NS	NS	60	NS
Pesticides						
Hexachlorobenzene	1.0	NS	1.0	NS	1.0	NS
4,4'-DDD (p,p'-DDD)	0.20	NS	NS	NS	0.20	NS
4,4'-DDE (p,p'-DDE)	0.05	NS	NS	NS	0.05	NS
4,4'-DDT (p,p'-DDT)	0.30	NS	NS	NS	0.3	NS
Aldrin	0.50	NS	NS	NS	0.5	NS
alpha-BHC	500	NS	NS	NS	500	NS
beta-BHC	2.0	NS	NS	NS	2.0	NS
delta-BHC	100	NS	NS	NS	100	NS
Dieldrin	0.10	NS	NS	NS	0.10	NS
Endosulfan	10	NS	NS	NS	10	NS
Endrin	2.0	NS	2.0	NS	2.0	NS
Gamma-BHC (Lindane)	0.20	NS	0.20	NS	0.20	NS
Heptachlor	0.40	NS	0.40	NS	0.40	NS
Heptachlor epoxide	0.20	NS	0.20	NS	0.20	NS
Methoxychlor	40	NS	40	NS	40	NS
Total Chlordane	2.0	NS	2.0	NS	2.0	NS
Toxaphene	100	NS	3.0	NS	100	NS
Metals						
Arsenic, Total	10	NS	10	NS	10	NS
Barium, Total	2,000	NS	2,000	NS	2,000	NS
Cadmium, Total	5.0	NS	5.0	NS	5.0	NS
Chromium, Total	100	NS	100	NS	100	NS
Copper, Total	NS	NS	1,300	NS	1,300	NS
Iron, Total	NS	NS	NS	NS	NS	NS
Lead, Total	15	NS	15	NS	15	NS
Manganese, Total	NS	NS	NS	NS	NS	NS
Silver, Total	100	NS	NS	NS	100	NS
Selenium, Total	50	NS	50	NS	50	NS
Mercury, Total	2.0	NS	2.0	NS	2.0	NS
Wet Chemistry						
Solids, Total Dissolved	NS	NS	NS	NS	500,000	NS
Anions						
Chloride	NS	NS	NS	NS	250,000	NS
Sulfate	NS	NS	NS	NS	250,000	NS
Nitrate/Nitrite						
Nitrate/Nitrite (as N)	NS	NS	10,000	NS	10,000	NS
Alkalinity, Total						
As CaCO3	NS	NS	NS	NS	NS	NS
Cyanide						
Cyanide, total	200	NS	200	NS	200	NS
COD						
Chemical Oxygen Demand	NS	NS	NS	NS	NS	NS

Notes:

[1] MassDEP MCL GW-1 Standards: 310.CMR 40.0000, 2014.

[2] Background concentrations determined from selected locations in each AOC.

[3] Drinking Water Standards and Health Advisories", Spring 2012, USEPA Office of Water.

[4] Cleanup goals were established by respective AOC RODs; Monitoring Criteria are used if the ROD did not include cleanup goals for listed analytes.

[5] USEPA Aquatic Life Water Quality Criterion for Surface Water benchmarks for iron and arsenic (USEPA 2018).

[6] EPH and VPH concentrations are evaluated against MCP standards for comparison purposes, but the standards are not considered cleanup goals under the ROD.

[7] Risk-based concentration.

Acronyms and Abbreviations:

µg/L = microgram per liter
AOC = Area of Contamination
COD = chemical oxygen demand
EPH = extractable petroleum hydrocarbon
MassDEP = Massachusetts Department of Environmental Protection
MCL = maximum contaminant level
MCP = Massachusetts Contingency Plan
ND = not detected
NS = no standard
PAH = polycyclic aromatic hydrocarbon
POL = Petroleum, Oils, and Lubricants
ROD = Record of Decision
SA = Study Area
USEPA - United States Environmental Protection Agency
VOC = volatile organic compound
VPH = volatile petroleum hydrocarbon

Table 7
DCL Leachate Discharge Permit No. 17 Limits
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analytical Fraction	Parameter	Discharge Limitation (mg/L)[a]
Metals Composite	Arsenic	0.20
	Chromium (total)	0.40
	Cadmium	0.045
	Copper	0.75
	Lead	0.20
	Nickel	0.60
	Silver	0.30
	Zinc	0.70
	Mercury	0.001
TSS	Total Suspended Solids	400
TTO	Total Toxic Organics	5.0
pH	pH (units)	5.5 - 9.5
Cyanide	Cyanide (Total)	NL
TPH	Total Petroleum Hydrocarbons	NL
Heptachlor-Pesticide		NL
Phenolics		NL

Notes:
[a] = Discharge Limit from Industrial Wastewater Permit No. 17

Acronyms and Abbreviations:
DCL = Devens Consolidation Landfill
mg/L = milligrams per liter
NL = No limit; for monitoring purposes only
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
TPH = total petroleum hydrocarbons
TSS = total suspended solids
TTO = Total toxic organics (sum of VOCs, SVOCs, pesticides, and PCBs)
VOC = volatile organic compound

Table 8
AOC 57 Area 3 Groundwater Analytical Results, Spring 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

			Location	57M-95-03X		57M-96-11X	
			Sample ID	57M-95-03X-SPR23		57M-96-11X-SPR23	57M-DUP01-SPR23
Analytical Method	Analyte	Units	Cleanup Goal	6/9/2023		06/09/2023	06/09/2023
Metals (Total)	Arsenic	µg/L	10*	**13**	**J**	**20**	**17**
	Iron	µg/L	NS	2,400		19,000	20,000
	Manganese	µg/L	NS	84		3,500	3,600
Field Parameters	Dissolved Oxygen	mg/L	NS	0.13		0.17	--
	Oxidation Reduction	mv	NS	-106		9	--
	pH	pH Units	NS	6.28		5.67	--
	Specific Conductivity	mS/cm	NS	0.62		1.78	--
	Temperature	°C	NS	11.9		12.3	--
	Turbidity	NTU	NS	0.63		2.61	--

Notes:

30 = Above cleanup goal

-- Not recorded for duplicate sample

* Cleanup Goal for arsenic is the MCL standard.

Acronyms and Abbreviations:

°C = degrees Celsius

µg/L = microgram per liter

µS/cm = microSiemens per centimeter

AOC = Area of Contamination

mg/L = milligram per liter

mV = millivolt

NS = no standard

NTU = Nephelometric Turbidity Unit

SU = standard unit

Table 9
AOC 57 Area 3 Surface Water Analytical Results, Spring 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

			Location	57-SW1
			Sample ID	57-SW1-SPR23
Analytical Method	Analyte	Units	Surface Water Benchmark	06/09/2023
Metals (Dissolved)	Arsenic	µg/L	150*	6.40
	Iron	µg/L	1,000*	**4,900**
	Manganese	µg/L	NS	5,800
Field Parameters	Dissolved Oxygen	mg/L	NS	5.91
	Oxidation Reduction Potential	mv	NS	23.4
	pH	pH Units	NS	5.96
	Specific Conductivity	mS/cm	NS	0.860
	Temperature	°C	NS	18.4
	Turbidity	NTU	NS	5.17

Notes:

12,000 = Above benchmark

* USEPA Aquatic Life Water Quality Criterion for Surface Water benchmarks for iron and arsenic (USEPA 2018).

Acronyms and Abbreviations:

°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microSiemens per centimeter
AOC = Area of Contamination
mg/L = milligram per liter
mV = millivolt
NS = No Standard
NTU = Nephelometric Turbidity Unit
SU = standard unit
USEPA = United States Environmental Protection Agency

Table 10
AOC 69W Groundwater Analytical Results, Fall 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

				Location	69W-94-13	69W-94-14	ZWM-01-25X	ZWM-95-15X	ZWM-95-18X	ZWM-99-22X	
				Sample ID	69W-94-13-FAL23	69W-94-14-FAL23	ZWM-01-25X-FAL23	ZWM-95-15X-FAL23	ZWM-95-18X-FAL23	AOC69W-DUP03-FAL23	ZWM-99-22X-FAL23
Analytical Method	Analyte	Units	Cleanup Goal[1]	Monitoring Criteria[2]	11/14/2023	11/15/2023	11/16/2023	11/15/2023	11/16/2023	11/16/2023	11/16/2023
EPH	2-Methylnaphthalene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	2.2
	Acenaphthene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.2 J
	Acenaphthylene	µg/L	NS	NS	1.3 U	1.3 U	1.4 U	1.3 U	1.4 U	--	2.1 J
	Anthracene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	0.97 J
	Benzo(a)anthracene	µg/L	NS	NS	1.3 U	1.3 U	1.4 U	1.3 U	1.4 U	--	1.3 U
	Benzo(a)pyrene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.1 U
	Benzo(b)fluoranthene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.1 U
	Benzo(g,h,i)perylene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.1 U
	Benzo(k)fluoranthene	µg/L	NS	NS	2.8 U	2.8 U	2.9 U	2.9 U	3.0 U	--	2.8 U
	C11-C22 Aromatics	µg/L	NS	200	9.4 J	28 U	29 U	13 J	30	--	100 J
	C19-C36 Aliphatics	µg/L	NS	14,000	19 U	9.80 J	11 J	11 J	12	--	19 U
	C9-C18 Aliphatics	µg/L	NS	700	57 U	57 U	58 U	57 U	60	--	57 U
	Chrysene	µg/L	NS	NS	0.94 U	0.95 U	0.97 U	0.95 U	1.0 U	--	0.95 U
	Dibenz(a,h)anthracene	µg/L	NS	NS	0.94 U	0.95 U	0.97 U	0.95 U	1.0 U	--	0.95 U
	Fluoranthene	µg/L	NS	NS	0.94 U	0.95 U	0.97 U	0.95 U	1.0 U	--	0.95 U
	Fluorene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.4 J
	Indeno(1,2,3-c,d)pyrene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.1 U
	Naphthalene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	1.1 U
	Phenanthrene	µg/L	NS	NS	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	--	0.72 J
	Pyrene	µg/L	NS	NS	9.4 U	9.5 U	9.7 U	9.5 U	10 U	--	9.5 U
Metals (Dissolved)	Arsenic	µg/L	10	NS	9.1	3.0 U	1.10 J	7.7	1.10 J	**120**	**110**
	Iron	µg/L	NS	9,100	570	50.0 U	50.0 U	1,200	50.0 U	11,000	11,000
	Manganese	µg/L	NS	291	320	120	1,100	380	61.0 J	1,100	1,000
Field Parameters	Dissolved Oxygen	mg/L	NS	NS	1.14	1.78	0.83	0.42	4.25	--	0.46
	Oxidation Reduction Potential	mv	NS	NS	-33.4	-29.8	111.9	-30.3	244.2	--	-29.2
	pH	pH Units	NS	NS	6.8	5.9	5.79	5.98	6.05	--	6.67
	Specific Conductivity	mS/cm	NS	NS	2.068	1.635	0.603	0.522	0.922	--	1.93
	Temperature	°C	NS	NS	14.2	11.9	13.7	10.6	12.6	--	12.4
	Turbidity	NTU	NS	NS	0.91	0.46	3.61	4.17	4.8	--	0.79

Notes:
100 = Above cleanup goal
-- = not analyzed
[1] Cleanup Goal for arsenic is the MCL standard.
[2] Monitoring criteria for iron and manganese are background levels from the RI (Final Remediation Investigation Report, Area of Contamination (AOC) 57, Devens, Massachusetts, HLA, 2000b).

Acronyms and Abbreviations:
°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microSiemens per centimeter
AOC = Area of Contamination
EPH = extractable petroleum hydrocarbon
J = Estimated result
MassDEP = Massachusetts Department of Environmental Protection
MCL = Maximum Contaminant Level
mg/L = milligram per liter
NS = no standard
J = Estimated result
U = Non-detect

Table 10
AOC 69W Groundwater Analytical Results, Fall 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

				Location	ZWM-99-23X	ZWM-99-24X	69WP-08-01	69WP-13-01
				Sample ID	ZWM-99-23X-FAL23	ZWM-99-24X-FAL23	69WP-08-01-FAL23	69WP-13-01-FAL23
Analytical Method	Analyte	Units	Cleanup Goal[1]	Monitoring Criteria[2]	11/16/2023	11/14/2023	11/16/2023	11/16/2023
EPH	2-Methylnaphthalene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Acenaphthene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Acenaphthylene	µg/L	NS	NS	1.5 U	1.3 U	--	--
	Anthracene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Benzo(a)anthracene	µg/L	NS	NS	1.5 U	1.3 U	--	--
	Benzo(a)pyrene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Benzo(b)fluoranthene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Benzo(g,h,i)perylene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Benzo(k)fluoranthene	µg/L	NS	NS	3.1 U	2.9 U	--	--
	C11-C22 Aromatics	µg/L	NS	200	23 J	29 U	--	--
	C19-C36 Aliphatics	µg/L	NS	14,000	10 J	13 J	--	--
	C9-C18 Aliphatics	µg/L	NS	700	63 U	57 U	--	--
	Chrysene	µg/L	NS	NS	1.0 U	0.96 U	--	--
	Dibenz(a,h)anthracene	µg/L	NS	NS	1.0 U	0.96 U	--	--
	Fluoranthene	µg/L	NS	NS	1.0 U	0.96 U	--	--
	Fluorene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Indeno(1,2,3-c,d)pyrene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Naphthalene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Phenanthrene	µg/L	NS	NS	1.3 U	1.1 U	--	--
	Pyrene	µg/L	NS	NS	10 U	9.6 U	--	--
Metals (Dissolved)	Arsenic	µg/L	10	NS	**23**	2.7 J	3.00 U	--
	Iron	µg/L	NS	9,100	2,100	630	6,400	--
	Manganese	µg/L	NS	291	1,300	67	370	30.0 U
Field Parameters	Dissolved Oxygen	mg/L	NS	NS	0.02	0.49	1.42	1.4
	Oxidation Reduction Potential	mv	NS	NS	-2	-33.1	-18.4	-23.3
	pH	pH Units	NS	NS	6.14	6.17	6.27	6.28
	Specific Conductivity	mS/cm	NS	NS	0.624	0.273	1.468	0.715
	Temperature	°C	NS	NS	14	12.6	13.4	13.3
	Turbidity	NTU	NS	NS	3.89	1.17	6.1	3.13

Notes:
100 = Above cleanup goal
-- = not analyzed
[1] Cleanup Goal for arsenic is the MCL standard.
[2] Monitoring criteria for iron and manganese are background levels from the RI (Final Remediation Investigation Report, Area of Contamination (AOC) 57, Devens, Massachusetts, HLA, 2000b).

Acronyms and Abbreviations:
°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microSiemens per centimeter
AOC = Area of Contamination
EPH = extractable petroleum hydrocarbon
J = Estimated result
MassDEP = Massachusetts Department of Environmental Protection
MCL = Maximum Contaminant Level
mg/L = milligram per liter
NS = no standard
J = Estimated result
U = Non-detect

Table 11
AOC 43G Groundwater Analytical Results, Fall 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

				Location	AAFES-2	AAFES-7	XGM-93-02X	XGM-94-04X	XGM-97-12X	
				Sample ID	AAFES-2-FAL23	AAFES-7-FAL23	XGM-93-02X-FAL23	XGM-94-04X-FAL23	XGM-97-12X-FAL23	AOC43G-DUP01-FAL23
Analytical Method	Analyte	Units	Cleanup Goal[1]	Monitoring Criteria[2]	11/09/2023	11/10/2023	11/13/2023	11/09/2023	11/13/2023	
General Chemistry	Alkalinity, Total (as CaCO3)	mg/L	NS	NS	160	--	140	160	170	--
Metals (Total)	Iron	µg/L	9,100	NS	**16,000**	--	7,100	200	**37,000**	**36,000**
	Manganese	µg/L	375	NS	**4,400**	160	**940**	**440**	**2,000**	**1,900**
VPH	Benzene	µg/L	5	NS	1.50 J	--	2.00 U	2.00 U	**6.3**	--
	C5-C8 Aliphatics	µg/L	NS	300	510	--	75.0 U	52.0 J	**470**	--
	C9-C10 Aromatics	µg/L	NS	200	430	--	75.0 U	62.0 J	**520**	--
	C9-C12 Aliphatics	µg/L	NS	700	320	--	75.0 U	75.0 U	360 J	--
	Ethylbenzene	µg/L	700	NS	1.30 J	--	3.80 U	1.80 J	120	--
	m,p-Xylene	µg/L	10,000	NS	7.50 U	--	7.50 U	7.50 U	62	--
	Methyl tert-butyl ether (MTBE)	µg/L	NS	NS	3.80 U	--	2.40 J	3.80 U	3.80 U	--
	Naphthalene	µg/L	NS	NS	2.70 J	--	3.80 U	3.80 U	95	--
	o-Xylene	µg/L	10,000	NS	3.80 U	--	3.80 U	3.80 U	29	--
	Toluene	µg/L	1,000	NS	1.30 J	--	3.80 U	3.80 U	1.90 J	--
Field Parameters	Dissolved Oxygen	mg/L	NS	NS	0.06	3.48	0.2	0.65	0.22	--
	Oxidation Reduction Potential	mv	NS	NS	-76.7	149.8	-33.7	30.3	-38.9	--
	pH	pH Units	NS	NS	6.45	6.12	6.42	6.87	6.79	--
	Specific Conductivity	mS/cm	NS	NS	2.06	1.051	2.539	2.642	2.558	--
	Temperature	°C	NS	NS	12.7	12.7	11.3	8.1	13.8	--
	Turbidity	NTU	NS	NS	14.2	4.48	0.27	0.88	1.86	--

Notes:

990	= Above cleanup goal
990	= Above monitoring criteria

-- = not analyzed

[1] The cleanup goal for iron is the background level. The cleanup goal for manganese is a site-specific goal established as part of the long-term monitoring plan for the site (Long-Term Monitoring Plan Former Fort Devens Army Installation, HGL, 2008). Benzene, ethylbenzene, xylenes, and toluene are not contaminants of concern but the cleanup goals are the Maximum Contaminant Levels (MCLs).

[2] The monitoring criteria for iron and manganese is the background from the RI (Final Remedial Investigation Report Area of Contamination (AOC) 43G, ABB Environmental Services, Inc., 1996). The monitoring criterion for arsenic is the MCL.

Acronyms and Abbreviations:
°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microSiemen per centimeter
AOC = Area of Contamination
J = Estimated result
MCL = Maximum Contaminant Level
NS = no standard
U = Non-detect

Table 12
AOCs 32/43A Groundwater Analytical Results, Spring 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

			Location	32M-01-13XBR	32M-01-14XOB	32M-01-17XBR	32M-01-18XBR	
			Sample ID	32M-01-13XBR-SPR23	32M-01-14XOB-SPR23	32M-01-17XBR-SPR23	32M-01-18XBR-SPR23	32M-DUP01-SPR23
Analytical Method	Analyte	Units	Cleanup Goal	06/08/2023	06/09/2023	06/07/2023	06/09/2023	06/09/2023
Metals (Total)	Arsenic	µg/L	10*	1.1 J	**12**	0.94 J	2.5 J	1.9 J
	Manganese	µg/L	3,500*	17	810	5.9 J	1,300	1,300
VOCs	1,1,1,2-Tetrachloroethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,1,1-Trichloroethane	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	1,1,2,2-Tetrachloroethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,1,2-Trichloroethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,1-Dichloroethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,1-Dichloroethene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,1-Dichloropropene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2,3-Trichlorobenzene	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	1,2,3-Trichloropropane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2,4-Trichlorobenzene	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	1,2,4-Trimethylbenzene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2-Dibromo-3-chloropropane	µg/L	NS	5 U	5 U	5 UJ	5 U	5 U
	1,2-Dibromoethane (EDB)	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2-Dichlorobenzene	µg/L	600*	1 U	1 U	1 UJ	1 U	0.31 J
	1,2-Dichloroethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2-Dichloroethene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,2-Dichloropropane	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	1,3,5-Trimethylbenzene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,3-Dichlorobenzene	µg/L	600*	1 U	1 U	1 UJ	1 U	1 U
	1,3-Dichloropropane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	1,4-Dichlorobenzene	µg/L	5*	1 U	1 U	1 UJ	1 U	1 U
	2,2-Dichloropropane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	2-Butanone (MEK)	µg/L	NS	20 U	20 U	20 UJ	20 U	20 U
	2-Chlorotoluene	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	2-Hexanone	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	4-Chlorotoluene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	4-Methyl-2-pentanone (MIBK)	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	Acetone	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	Benzene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Bromobenzene	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	Bromochloromethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Bromodichloromethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Bromoform	µg/L	NS	2 U	2 UJ	2 UJ	2 UJ	2 UJ
	Bromomethane	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	Carbon disulfide	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Carbon Tetrachloride	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Chlorobenzene	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	Chloroethane	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	Chloroform	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Chloromethane	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	cis-1,2-Dichloroethene	µg/L	55*	1 U	1 U	1 UJ	1 U	1 U
	cis-1,3-Dichloropropene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Cumene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Dibromochloromethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Dibromomethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Dichlorodifluoromethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Ethylbenzene	µg/L	NS	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
	Hexachlorobutadiene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	m,p-Xylene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Methyl tert-butyl ether (MTBE)	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	Methylene chloride	µg/L	NS	10 U	10 U	10 UJ	10 U	10 U
	n-Butylbenzene	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	n-Propylbenzene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Naphthalene	µg/L	NS	5 U	5 U	5 UJ	5 U	5 U
	o-Xylene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	p-Cymene (p-Isopropyltoluene)	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	sec-Butylbenzene	µg/L	NS	2 U	2 U	2 UJ	2 U	2 U
	Styrene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	tert-Butylbenzene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Tetrachloroethene (PCE)	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Toluene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	trans-1,2-Dichloroethene	µg/L	100*	1 U	1 U	1 UJ	1 U	1 U
	trans-1,3-Dichloropropene	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Trichloroethene (TCE)	µg/L	5*	0.5 U	0.5 U	0.5 UJ	0.5 U	0.35 J
	Trichlorofluoromethane	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
	Vinyl acetate	µg/L	NS	2 U	2 UJ	2 UJ	2 UJ	2 UJ
	Vinyl chloride	µg/L	2*	1 U	1 U	1 UJ	1 U	1 U
	Xylenes, Total	µg/L	NS	1 U	1 U	1 UJ	1 U	1 U
VPH	Benzene	µg/L	NS	2 U	2 UJ	2 UJ	2 U	2 U
	C5-C8 Aliphatics	µg/L	NS	50 U	50 UJ	50 UJ	50 U	50 U
	C9-C10 Aromatics	µg/L	NS	20 U	20 UJ	20 UJ	20 U	20 U
	C9-C12 Aliphatics	µg/L	NS	50 U	50 UJ	50 UJ	50 U	50 U
	Ethylbenzene	µg/L	NS	2 U	2 UJ	2 UJ	2 U	2 U
	m,p-Xylene	µg/L	NS	5 U	5 UJ	5 UJ	5 U	5 U
	Methyl tert-butyl ether (MTBE)	µg/L	NS	2 U	2 UJ	2 UJ	2 U	2 U
	Naphthalene	µg/L	NS	4 U	4 UJ	4 UJ	4 U	4 U
	o-Xylene	µg/L	NS	2 U	2 UJ	2 UJ	2 U	2 U
	Toluene	µg/L	NS	2 U	2 UJ	2 UJ	2 U	2 U
Field Parameters	Dissolved Oxygen	mg/L	NS	5.7	1.51	0.58	3.86	3.86
	Oxidation Reduction Potential	mv	NS	116	94.4	-41.4	214	214
	pH	pH Units	NS	6.33	5.93	7.02	6.35	6.35
	Specific Conductivity	mS/cm	NS	5.54	0.9	1.29	4.3	4.3
	Temperature	°C	NS	15.5	13.9	14.7	13.8	13.8
	Turbidity	NTU	NS	18.6	26.7	4.27	2.6	2.6

Notes:

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* The cleanup goal for arsenic and select VOCs is the MCL; the cleanup goal for manganese is the background level.

Acronyms and Abbreviations:

°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microSiemen per centimeter
AOC = Area of Contamination
J = Estimated result
MCL = maximum contaminant level
mg/L = milligram per liter
mV = millivolt
NS = no standard
NTU = Nephelometric Turbidity Unit
SU = standard unit
U = Non-detect
VOCs = volatile organic compounds
VPH = volatile petroleum hydrocarbon

Table 13
DCL Groundwater Analytical Results, Spring 2023
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Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

			Location	LFM-03-07	LFM-99-02B	LFM-99-05A		LFM-99-06A-RP
			Sample ID	LFM-03-07-SPR23	LFM-99-02B-SPR23	LFM-99-05A-SPR23	LFM-DUP01-SPR23	LFM-99-06A-RP-SPR23
Analytical Method	Analyte	Units	Cleanup Goal	06/08/2023	06/08/2023	06/08/2023	06/08/2023	06/08/2023
EPH	2-Methylnaphthalene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Acenaphthene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Acenaphthylene	µg/L	NS	1.4 UJ	1.4 UJ	1.4 UJ	1.3 UJ	1.3 UJ
	Anthracene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Benzo(a)anthracene	µg/L	NS	1.4 UJ	1.4 UJ	1.4 UJ	1.3 UJ	1.3 UJ
	Benzo(a)pyrene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Benzo(b)fluoranthene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Benzo(g,h,i)perylene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Benzo(k)fluoranthene	µg/L	NS	2.9 UJ	2.9 UJ	3.1 UJ	2.9 UJ	2.9 UJ
	C11-C22 Aromatics	µg/L	200*	29 UJ	29 UJ	31 UJ	29 UJ	29 UJ
	C19-C36 Aliphatics	µg/L	14,000*	19 UJ	19 UJ	21 UJ	19 UJ	19 UJ
	C9-C18 Aliphatics	µg/L	700*	58 UJ	58 UJ	62 UJ	58 UJ	57 UJ
	Chrysene	µg/L	NS	0.97 UJ	0.97 UJ	1 UJ	0.96 UJ	0.96 UJ
	Dibenz(a,h)anthracene	µg/L	NS	0.97 UJ	0.97 UJ	1 UJ	0.96 UJ	0.96 UJ
	Fluoranthene	µg/L	NS	0.97 UJ	0.97 UJ	1 UJ	0.96 UJ	0.96 UJ
	Fluorene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Indeno(1,2,3-c,d)pyrene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Naphthalene	µg/L	NS	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
	Phenanthrene	µg/L	NS	1.2 UJ	0.93 J	1.2 UJ	1.2 UJ	1.1 UJ
	Pyrene	µg/L	NS	9.7 UJ	9.7 UJ	10 UJ	9.6 UJ	9.6 UJ
General Chemistry	Alkalinity, Total (as CaCO3)	mg/L	NS	98	81	98	98	92
	Chemical Oxygen Demand	mg/L	NS	20 U	20 U	20 U	20 U	20 U
	Chloride	mg/L	NS	260	250	170	180	310
	Cyanide	mg/L	0.2*	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
	Nitrate-Nitrite (as N)	mg/L	NS	1	0.26	0.41	0.41	0.77
	Sulfate	mg/L	NS	33	14	16	17	30
	Total Dissolved Solids	mg/L	NS	620	490	430	440	670
Metals (Total)	Arsenic	µg/L	10*	3 U	3 U	3 U	3 U	3 U
	Barium	µg/L	2,000*	16 J	9.1 J	15 J	14 J	6.9 J
	Cadmium	µg/L	5*	1 U	1 U	1 U	1 U	1 U
	Chromium	µg/L	100*	4 U	4 U	4 U	4 U	4 U
	Copper	µg/L	1,300*	10 U	10 U	10 U	10 U	10 U
	Iron	µg/L	NS	50 U	50 U	50 U	50 U	50 U
	Lead	µg/L	15*	20 U	20 U	20 U	20 U	20 U
	Manganese	µg/L	NS	5 U	5 U	5 U	5 U	5 U
	Mercury	µg/L	2*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Selenium	µg/L	100 *	20 U	20 U	20 U	20 U	20 U
	Silver	µg/L	2*	5 U	5 U	5 U	5 U	5 U
Pesticides	Aldrin	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	alpha-BHC (alpha-Hexachlorocyclohexane)	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	alpha-Endosulfan	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	beta-BHC (beta-Hexachlorocyclohexane)	µg/L	NS	0.0039 U	0.0039 U	0.0097 J	0.0043 U	0.0038 U
	beta-Endosulfan	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Chlordane	µg/L	NS	0.39 U	0.39 U	0.42 U	0.43 U	0.38 U
	delta-BHC (delta-Hexachlorocyclohexane)	µg/L	NS	0.0039 U	0.0039 U	0.0042 U	0.0043 U	0.0038 U
	Dieldrin	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Endosulfan sulfate	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Endrin	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Endrin aldehyde	µg/L	NS	0.016 UJ	0.016 UJ	0.017 UJ	0.017 UJ	0.015 UJ
	Endrin ketone	µg/L	NS	0.016 UJ	0.016 UJ	0.017 UJ	0.017 UJ	0.015 UJ
	gamma-BHC (Lindane)	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Heptachlor	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Heptachlor epoxide	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	Methoxychlor	µg/L	NS	0.0039 U	0.0039 U	0.0042 U	0.0043 U	0.0038 U
	p,p'-DDD	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	p,p'-DDE	µg/L	NS	0.0039 UJ	0.0039 UJ	0.0042 UJ	0.0043 UJ	0.0038 UJ
	p,p'-DDT	µg/L	0.3*	0.0039 U	0.0039 UJ	0.0042 U	0.0043 U	0.0038 U
	Toxaphene	µg/L	NS	0.78 U	0.78 U	0.84 U	0.85 U	0.77 U
VPH	Benzene	µg/L	NS	2 U	2 U	2 U	2 U	2 U
	C5-C8 Aliphatics	µg/L	300*	50 U	50 U	50 U	50 U	50 U
	C9-C10 Aromatics	µg/L	200*	20 U	20 U	20 U	20 U	20 U
	C9-C12 Aliphatics	µg/L	700*	50 U	50 U	50 U	50 U	50 U
	Ethylbenzene	µg/L	700*	2 U	2 U	2 U	2 U	2 U
	m,p-Xylene	µg/L	NS	5 U	5 U	5 U	5 U	5 U
	Methyl tert-butyl ether (MTBE)	µg/L	70*	2 U	2 U	2 U	2 U	2 U
	Naphthalene	µg/L	140*	4 U	4 U	4 U	4 U	4 U
	o-Xylene	µg/L	10,000*	2 U	2 U	2 U	2 U	2 U
	Toluene	µg/L	1,000*	2 U	2 U	2 U	2 U	2 U
Field Parameters	Dissolved Oxygen	mg/L	NS	7.55	8.87	5.06	---	7.5
	Oxidation Reduction Potential	mv	NS	150	225	169	---	119
	pH	pH Units	NS	6.17	6.11	6.26	---	6.28
	Specific Conductivity	mS/cm	NS	1.49	1.31	0.693	---	1.71
	Temperature	°C	NS	12.8	10.2	11.2	---	12.8
	Turbidity	NTU	NS	0.74	1.3	1.3	---	1.52

Notes:
* Monitoring Criteria are equal to the MassDEP MCL GW-1 standards (310 CMR 40.0000, 2014) and/or the Drinking Water Standards and Health Advisories (USEPA Office of Water, 2012).

Acronyms and Abbreviations:
°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microsiemens per centimeter
DCL = Devens Consolidation Landfill
EPH = extractable petroleum hydrocarbon
J = Estimated Result
mg/L = milligram per liter
mV = millivolts
NS = No Standard
NTU = Nephelometric Turbidity Unit
SU = Standard Unit
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect because of QC outliers.

Table 14
DCL Groundwater Analytical Results, Fall 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

			Location	LFM-03-07	LFM-99-02B	LFM-99-05A		LFM-99-06A-RP
			Sample ID	LFM-03-07-FAL23	LFM-99-02B-FAL23	LFM-99-05A-FAL23	LFM-DUP01-FAL23	LFM-99-06A-RP-FAL23
Analytical Method	**Analyte**	**Units**	**Monitoring Criteria[1]**	**11/07/2023**	**11/07/2023**	**11/07/2023**	**11/07/2023**	**11/07/2023**
EPH	2-Methylnaphthalene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Acenaphthene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Acenaphthylene	µg/L	NS	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U
	Anthracene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Benzo(a)anthracene	µg/L	NS	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U
	Benzo(a)pyrene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Benzo(b)fluoranthene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Benzo(g,h,i)perylene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Benzo(k)fluoranthene	µg/L	NS	2.9 U	3 U	3.2 U	3.1 U	3.2 U
	C11-C22 Aromatics	µg/L	200	29 U	30 U	32 U	31 U	32 U
	C19-C36 Aliphatics	µg/L	14,000	49 U	20 U	21 U	21 U	21 U
	C9-C18 Aliphatics	µg/L	700	29 J	59 U	63 U	62 U	64 U
	Chrysene	µg/L	NS	0.98 U	0.99 U	1.1 U	1 U	1.1 U
	Dibenz(a,h)anthracene	µg/L	NS	0.98 U	0.99 U	1.1 U	1 U	1.1 U
	Fluoranthene	µg/L	NS	0.98 U	0.99 U	1.1 U	1 U	1.1 U
	Fluorene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Indeno(1,2,3-c,d)pyrene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Naphthalene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Phenanthrene	µg/L	NS	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U
	Pyrene	µg/L	NS	9.8 U	9.9 U	11 U	10 U	11 U
GENCHEM	Alkalinity, Total (as CaCO3)	mg/L	NS	110	88	110 J	54 J	110
	Chemical Oxygen Demand	mg/L	NS	20 U	13 J	10 J	20 U	20 U
	Chloride	mg/L	NS	200	180	170	170	230
	Cyanide	mg/L	0.2	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
	Nitrate-Nitrite (as N)	mg/L	NS	0.025 U	0.025 R	0.025 U	0.025 U	0.025 U
	Sulfate	mg/L	NS	31	13	14	14	30
	Total Dissolved Solids	mg/L	NS	460	380	440	400	510
HG	Mercury	µg/L	10	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Metals	Arsenic	µg/L	2,000	1.1 J	3 U	3 U	3 U	3 U
	Barium	µg/L	5	13 J	8.2 J	14 J	15 J	4.7 J
	Cadmium	µg/L	100	1 U	1 U	1 U	1 U	1 U
	Chromium	µg/L	1,300	4 U	4 U	4 U	4 U	4 U
	Copper	µg/L	NS	10 U	10 U	10 U	10 U	10 U
	Iron	µg/L	15	83 J	50 U	50 U	50 U	50 U
	Lead	µg/L	NS	20 U	20 U	20 U	20 U	20 U
	Manganese	µg/L	2	1.9 J	5 U	5 U	5 U	5 U
	Selenium	µg/L	100	20 U	20 U	20 U	20 U	20 U
	Silver	µg/L	2	5 U	5 U	5 U	5 U	5 U
PEST	Aldrin	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	alpha-BHC (alpha-Hexachlorocyclohexane)	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	alpha-Endosulfan	µg/L	NS	0.0041 U	0.004 UJ	0.0042 U	0.0042 U	0.0043 U
	beta-BHC (beta-Hexachlorocyclohexane)	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	beta-Endosulfan	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Chlordane	µg/L	NS	0.41 U	0.4 U	0.42 U	0.42 U	0.43 U
	delta-BHC (delta-Hexachlorocyclohexane)	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Dieldrin	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Endosulfan sulfate	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Endrin	µg/L	NS	0.0041 U	0.004 UJ	0.0042 U	0.0042 U	0.0043 U
	Endrin aldehyde	µg/L	NS	0.016 U	0.016 U	0.017 U	0.017 U	0.017 U
	Endrin ketone	µg/L	NS	0.016 J	0.018 J	0.022 J	0.011 J	0.022 J
	gamma-BHC (Lindane)	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Heptachlor	µg/L	NS	0.0064 J	0.004 U	0.0042 U	0.0042 U	0.0031 J
	Heptachlor epoxide	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	Methoxychlor	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	p,p'-DDD	µg/L	NS	0.0041 U	0.004 UJ	0.0042 U	0.0042 U	0.0043 U
	p,p'-DDE	µg/L	NS	0.0041 U	0.004 U	0.0042 U	0.0042 U	0.0043 U
	p,p'-DDT	µg/L	0.3	0.0041 U	0.004 UJ	0.0042 U	0.0042 U	0.0043 U
	Toxaphene	µg/L	NS	0.82 U	0.81 U	0.84 U	0.85 U	0.86 U
VPH	Benzene	µg/L	NS	2 U	2 U	2 U	2 U	2 U
	C5-C8 Aliphatics	µg/L	300	75 U	75 U	75 U	75 U	75 U
	C9-C10 Aromatics	µg/L	200	75 U	75 U	75 U	75 U	75 U
	C9-C12 Aliphatics	µg/L	700	75 U	75 U	75 U	75 U	75 U
	Ethylbenzene	µg/L	700	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
	m,p-Xylene	µg/L	NS	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
	Methyl tert-butyl ether (MTBE)	µg/L	70	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
	Naphthalene	µg/L	140	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
	o-Xylene	µg/L	10,000	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
	Toluene	µg/L	1,000	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Field Parameters	Dissolved Oxygen	mg/L	NS	4.42	5.89	5.4	--	5.89
	Oxidation Reduction Potential	mv	NS	228	232.9	213.7	--	152.1
	pH	pH Units	NS	6.24	6.23	6.29	--	6.26
	Specific Conductivity	mS/cm	NS	0.941	0.769	0.575	--	0.658
	Temperature	°C	NS	15.2	13.7	12.1	--	12.5
	Turbidity	NTU	NS	27.3	11.1	2.1	--	1.65

Notes:
[1] Monitoring Criteria are equal to the MassDEP MCL GW-1 standards (310 CMR 40.0000, 2014) and/or the Drinking Water Standards and Health Advisories (USEPA Office of Water, 2012).

Acronyms and Abbreviations:
°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microsiemens per centimeter
DCL = Devens Consolidation Landfill
EPH = extractable petroleum hydrocarbon
J = Estimated Result
mg/L = milligram per liter
mV = millivolts
NS = No Standard
NTU = Nephelometric Turbidity Unit
R = data rejected
SU = Standard Unit
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect because of QC outliers.

Table 15
DCL Leachate Analytical Results, Fall 2023
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

MassDevelopment Industrial Wastewater Discharge Permit No. 017 (Summary)			
Parameter	**Units**	**Discharge Limitation (µg/L)[a]**	**Annual Sampling Event Date Sampled: 11/7/2023 and 11/14/2023**
Metals			
Aluminum	µg/L	NL	150 U
Arsenic	µg/L	200	4.4 J
Cadmium	µg/L	45	1.0 U
Chromium	µg/L	400	4.0 U
Copper	µg/L	750	9.5 J
Lead	µg/L	200	20 U
Mercury	µg/L	1	0.2 U
Nickel	µg/L	600	10 U
Silver	µg/L	300	5.0 U
Zinc	µg/L	700	20 U
Other			
Total Toxic Organics	µg/L	5,000	0.0199
Total Suspended Solids	mg/L	400	8.3
Cyanide (total)	mg/L	NL	0.005 U
Total Petroleum Hydrocarbons (Diesel-Range Organics)	mg/L	NL	0.22 J
Phenols (total)	mg/L	NL	0.05 U
pH (units)	SU	5.5 – 9.5	7.2

Notes:

1. Total Toxic Organics is the sum of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBS) and pesticides.

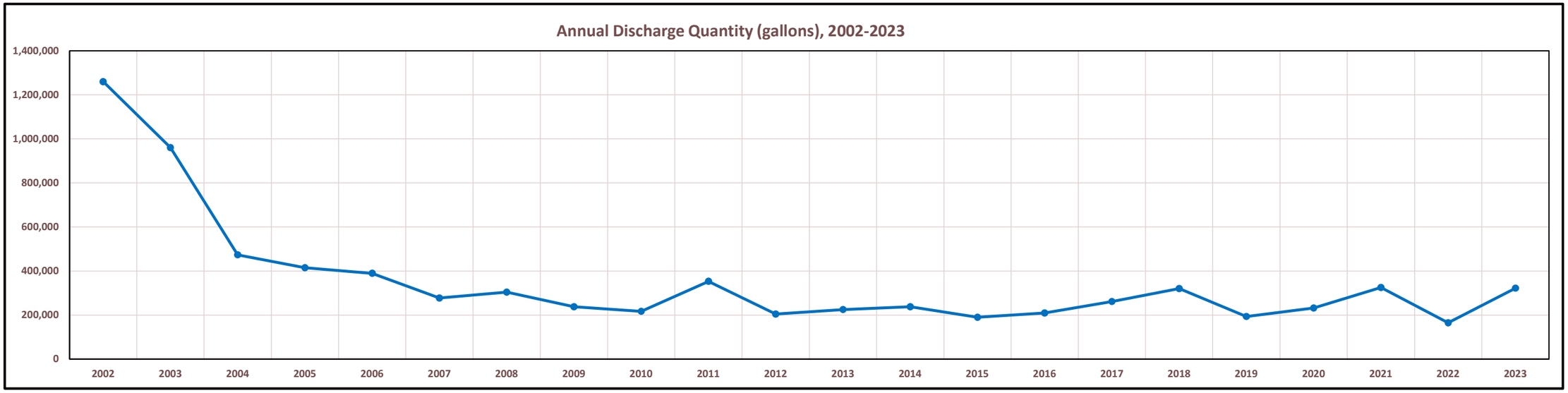
Abbreviations:

µg/L = microgram per liter
J = Estimated result
mg/L = milligram per liter
NL = No limit
SU = Standard Unit
U = The target analyte was not detected at or above the indicated laboratory reporting limit of detection

Table 16
DCL Leachate Annual Discharge Quantities
2023 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Period	Discharge Quantities (Gallons)																					
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Annual Total	1,259,866	960,394	473,802	414,858	390,085	277,626	304,547	237,983	217,155	353,618	204,483	225,768	237,752	190,403	209,849	261,989	320,357	193,649	232,469	325,249	165,191	322,448

Total Leachate Discharge Quantity (2002-2023) = 7,779,542



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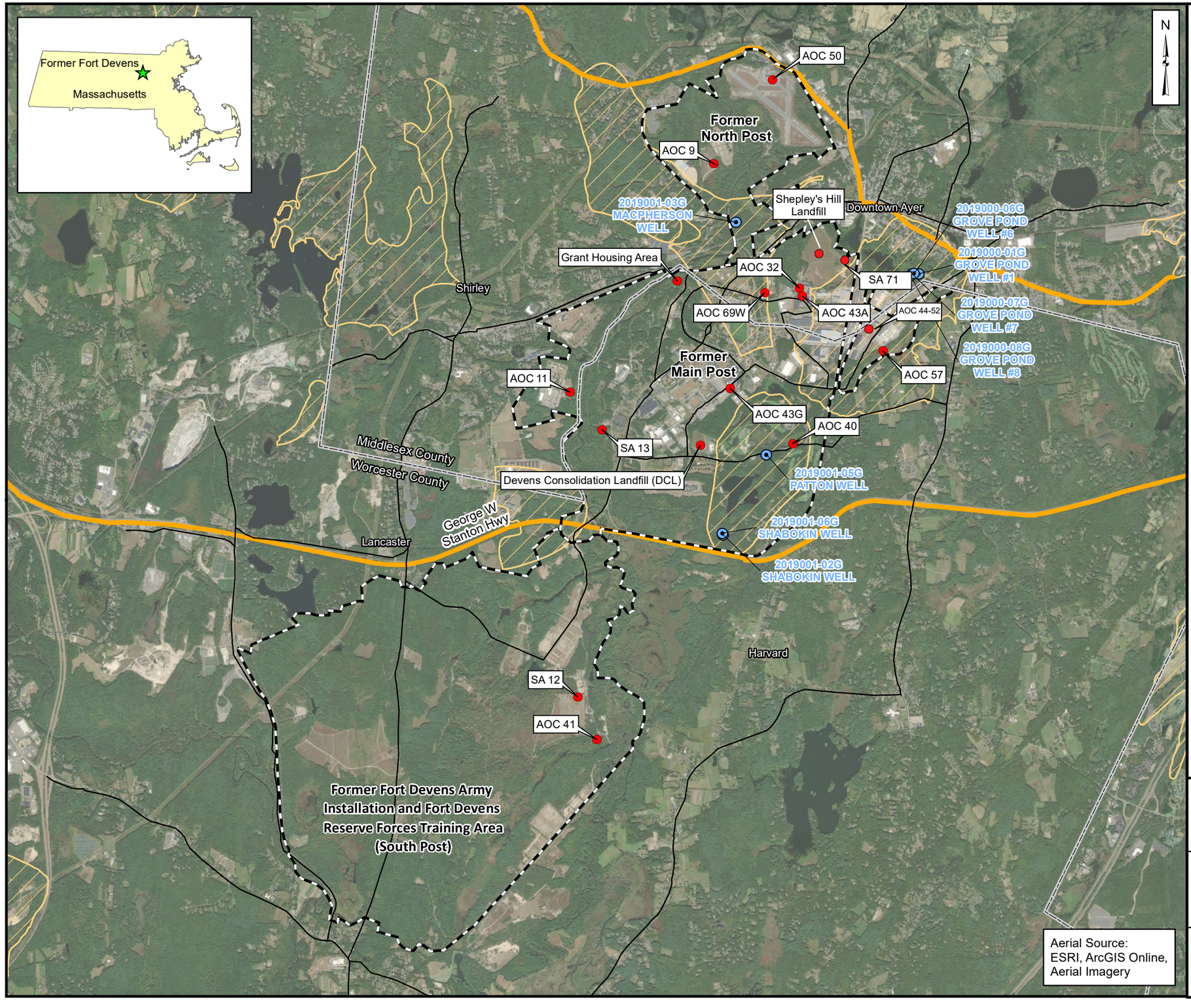

Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Water Supply Well
- County Line
- Highway
- Major Road
- MassDEP Zone II Wellhead Protection Area

MassDEP = Massachusetts Department of Environmental Protection

0 1 2
Miles

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Location
Former Fort Devens
Army Installation

SERES Engineering & Services, LLC
ARCADIS
a joint venture

Figure
1

Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Former Building
- Irrigation Well (approximate location)
- Stream
- Walking Trail
- Topographic Contour (ft AMSL)

Notes:
1. The entirety of AOC 57 lies within a MassDEP Zone II Wellhead Protection Area.

ft AMSL = feet above mean sea level
MassDEP = Massachusetts Department of Environmental Protection

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 57
Areas 1, 2, & 3

SERES Engineering & Services, LLC
ARCADIS a joint venture

Figure
2

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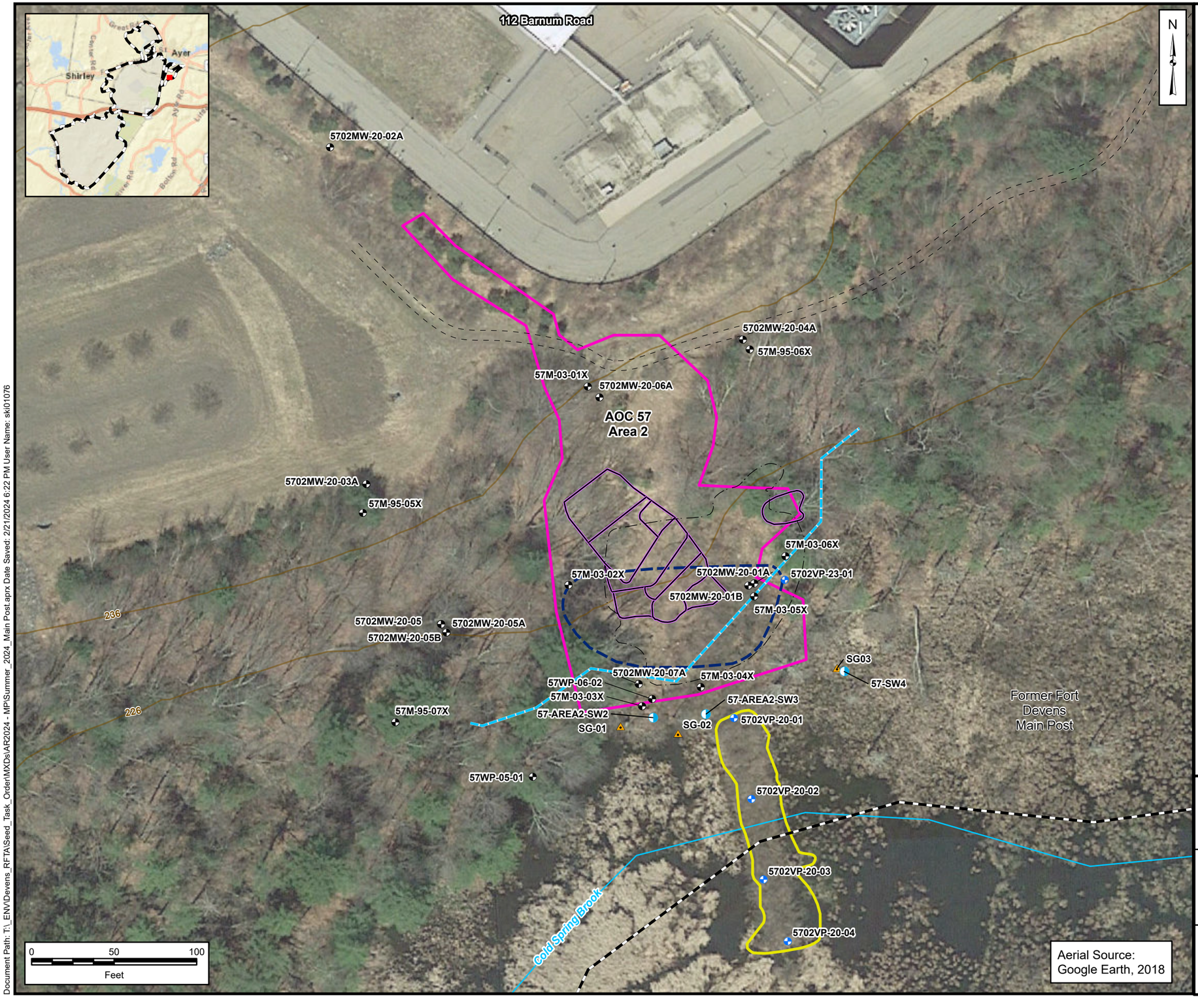


Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Final Excavation Limit (2003)
- Conti Excavation Limit (2002)
- Flagged Wetland Limits
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on fall 2003 to spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Containment Dam
- Stream
- Walking Trail
- Topographic Contour (ft AMSL)
- Monitoring Well
- Vertical Profile
- Surface Water Sample Location
- Staff Gauge

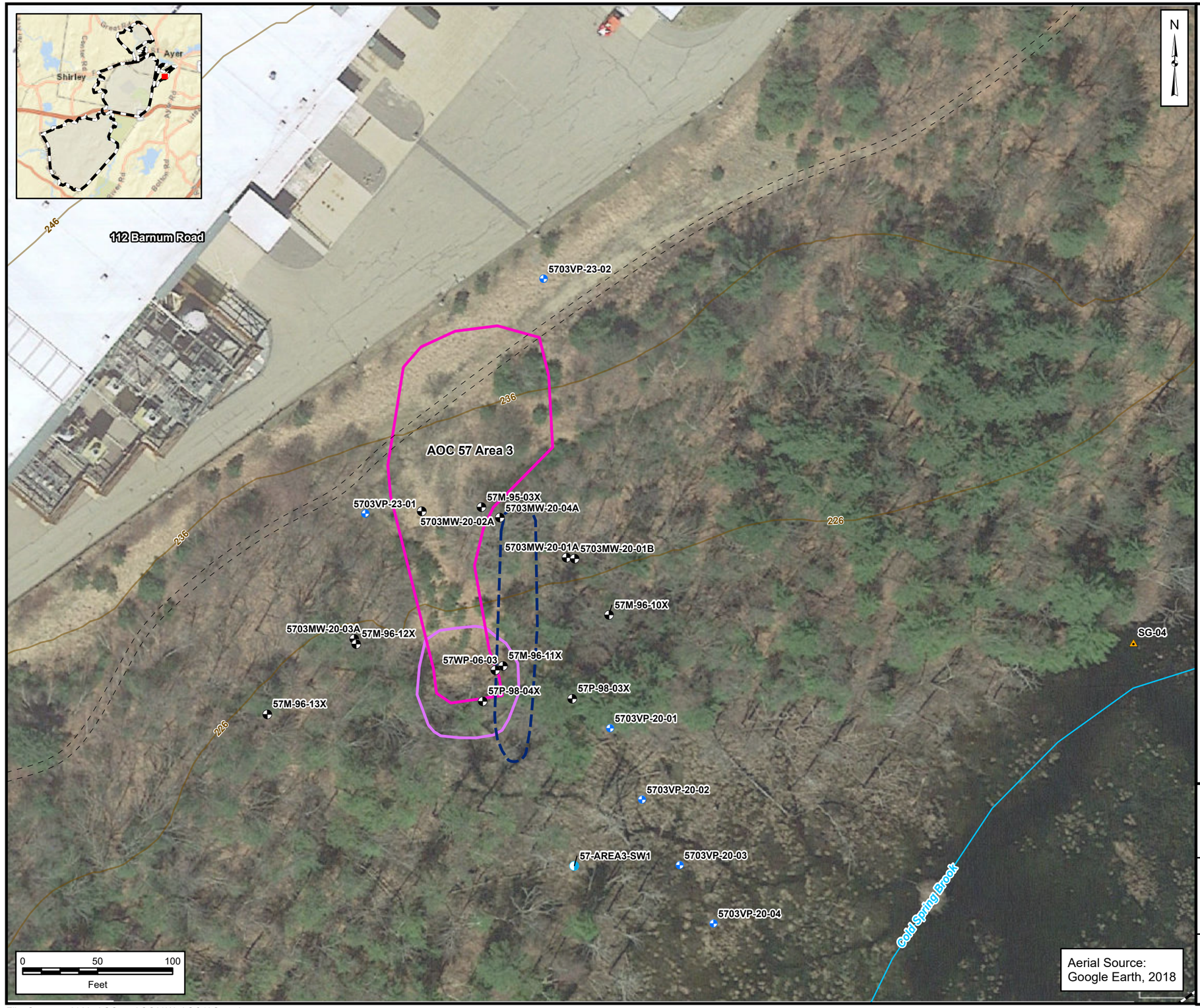
Notes and Abbreviations:
1. ft AMSL = feet above mean sea level
2. MassDEP = Massachusetts Department of Environmental Protection

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 57
Area 2

SERES Engineering & Services, LLC
ARCADIS
a joint venture

Figure
3



N

Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on Fall 2003 to Spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Alternate III-2a Estimated Soil Excavation Area
- Stream
- Walking Trail
- Topographic Contour (ft AMSL)
- Monitoring Well
- Vertical Profile
- Surface Water Sample Location
- Staff Gauge

Notes and Abbreviations:
1. ft AMSL = feet above mean sea level
2. MassDEP = Massachusetts Department of Environmental Protection

Aerial Source: Google Earth, 2018

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 57
Area 3

SERES Engineering & Services, LLC
ARCADIS a joint venture

Figure
4

Document Path: T:_ENV\Devens_RFTA\Seed_Task_Order\MXDs\AR2023 - MP\Summer_2023_AOC57_AOC69W_AOC43G.aprx Date Saved: 12/28/2023 7:12 PM User Name: yadavs0264

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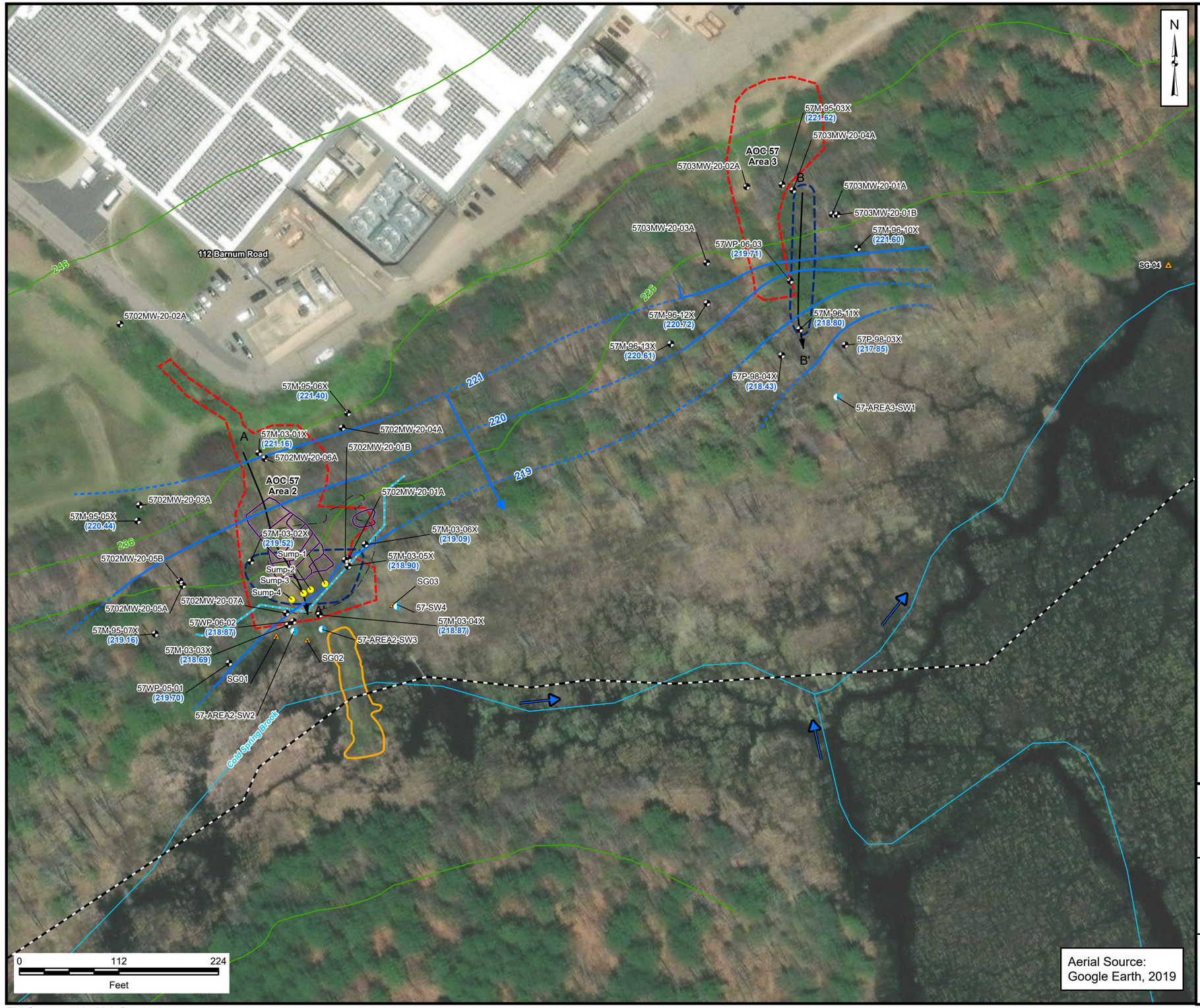

Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Monitoring Well
- Surface Water Sample Location
- Sump
- Staff Gauge
- Monitoring Well - Destroyed
- Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 1 ft)
- Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 1 ft) (Inferred)
- A——A' Groundwater Gradient Calculation Location
- Final Excavation Limit (2003)
- Conti Excavation Limit (2002)
- Flagged Wetland Limits
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on fall 2003 to spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Containment Dam
- Stream
- Groundwater Flow Direction
- Surface Water Flow Direction
- Topographic Contour (ft AMSL)
- (221.16) Groundwater Elevation (ft NAVD88)

Notes:
1. The entirety of AOC 57 lies within a MassDEP Zone II Wellhead Protection Area.

ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NAVD88 = North American Vertical Datum of 1988

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Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Groundwater Elevation Contour Map
AOC 57 - Areas 2 & 3
Spring 2023

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Figure
5

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Notes:

Groundwater Cleanup Goals	
Metals	Result (µg/L)
Arsenic (Total)	10
Iron (Total)	NS
Manganese (Total)	NS

Surface Water Benchmarks	
Metals	Result (µg/L)
Arsenic (Dissolved)	150
Iron (Dissolved)	1,000
Manganese (Dissolved)	NS

1. Bold concentrations indicate exceedances of Groundwater Cleanup Goal or Surface Water Benchmark.

ft AMSL = feet above mean sea level
J = estimated value
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NS = No Standard
µg/L = micrograms per liter

N

246

236

226

AOC 57 Area 3

57M-95-03X

57M-95-03X	06/09/2023
	Result (µg/L)
Arsenic (Total)	**13 J**
Iron (Total)	2,400
Manganese (Total)	84

57M-96-10X

57M-96-12X

57WP-06-03

57M-96-11X

57M-96-11X	06/09/2023
	Result (µg/L)
Arsenic (Total)	**20 (17)**
Iron (Total)	19,000 (20,000)
Manganese (Total)	3,500 (3,600)

57M-96-13X

57P-98-03X

57P-98-04X

57-AREA3-SW1

57-SW1	06/09/2023
	Result (µg/L)
Arsenic (Dissolved)	6.4
Iron (Dissolved)	**4,900**
Manganese (Dissolved)	5,800

Spring Brook

Aerial Source:
Google Earth, 2019

Legend

- Area of Contamination (AOC)
- LTM Sample Well
- LTM Well - Gauge Only
- Well Point - Gauge Only
- LTM Piezometer
- Surface Water Sample Location
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on Fall 2003 to Spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Alternate III-2a Estimated Soil Excavation Area
- Stream
- Topographic Contour (ft AMSL)
- Former Fort Devens Boundary

Note:
1. The entirety of AOC 57 lies within a MassDEP Zone II Wellhead Protection Area.

0 50 100
Feet

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Devens, Massachusetts

Metals Concentrations in Groundwater and Surface Water
AOC 57 - Area 3
Spring 2023

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Figure 6

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Willow Brook piezometer
located 1/4 mile to the north
along the west bank of Willow Brook

69WSG-23-01
69WP-13-01
Groundwater Restriction
Boundary
69WP-08-01
69W-23-01
Jackson Road
ZWM-95-18X
ZWP-95-02X
ZWM-01-25X
69W-23-02
ZWM-95-15X
ZWM-01-26X
ZWM-99-23X
69W-94-14
ZWM-99-24X
ZWP-95-01X
69W-94-12
69W-94-13
ZWM-99-22X
69W-23-03
69WVP-23-01
69WSG-23-02
ZWM-95-16X
Willow Brook
Francis W. Parker Charter
Essential School
Building 215
Antietam Street
ZWM-95-17X

246
236
256

N

Aerial Source:
Google Earth, 2019

Legend

- Parcel A.15 Boundary
- Groundwater Restriction and Educational, Institutional, and Open Space Use Restriction
- Monitoring Well(Other)
- Vertical Profile
- Staff Gauge
- Surface Water Course
- Excavated Soils Management Area (ESMA) (Soil Excavation Restriction)
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area

Note:
Boundaries and site features shown on the figure are approximate.

ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 69W

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Figure
7

Path: T:_ENV\Devens_RFTA\Seed_Task_Order\MXDs\AR2023 - MP\Summer_2023_AOC57_AOC69W_AOC43G.aprx

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Willow Brook piezometer
located 1/4 mile to the north
along the west bank of Willow Brook

69WP-13-01
(217.29)

69WP-08-01
(218.69)

ZWM-95-18X
(219.68)

ZWP-95-02X
(219.92)

ZWM-01-25X
(220.47)

ZWM-95-15X
(221.04)

ZWM-01-26X
(220.94)

ZWM-99-23X
(221.17)

69W-94-14
(221.24)

ZWP-95-01X
(221.86)

ZWM-99-24X
(221.83)

69W-94-12
(222.18)

69W-94-13
(222.12)

ZWM-99-22X
(222.77)

ZWM-95-16X
(223.67)

ZWM-95-17X
(224.91)

218
219
220
221
222
223
224
226
236
246
256

Jackson Road

Willow Brook

Antietam Street

Francis W. Parker Charter
Essential School

Building 215

Aerial Source:
Google Earth, 2019

N

Legend

- Parcel Boundary (Parcel A15 Boundary)
- LTM Sample Well
- LTM Sample Well Point
- LTM Well - Gauge Only
- LTM Piezometer
- Surface Water Course
- Groundwater Elevation Contour (ft. NAVD88) (Contour Interval 1 ft.)
- Excavated Soils Management Area (ESMA)
- Soil Excavation Limits (1997-1998)
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area
- (222.77) Groundwater Elevation (ft. NAVD88)

Note:
Boundaries and site features shown on the figure are approximate.
Historical site features digitized from historical site plan "Figure ES-1, RI Sampling Locations, AOC 69W" (Harding Lawson Associates, Inc. 1998)

AOC = area of contamination
ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
UST = underground storage tank
NS = not sampled

0 200 400
Feet

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Devens, Massachusetts

Groundwater Elevation Contour Map
AOC69W
Fall 2023

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Figure 8

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Willow Brook piezometer located 1/4 mile to the north along the west bank of Willow Brook

69WP-13-01	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	NA
Iron (Dissolved)	NA
Manganese (Dissolved)	30 U

69WP-13-01

ZWM-95-18X	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	1.1 J
Iron (Dissolved)	50 U
Manganese (Dissolved)	61 J

69WP-08-01

69WP-08-01	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	3.0 U
Iron (Dissolved)	6,400
Manganese (Dissolved)	370

ZWM-95-18X

Jackson Road

ZWP-95-02X

ZWM-01-25X	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	1.10 J
Iron (Dissolved)	50 U
Manganese (Dissolved)	1,100

ZWM-01-25X

ZWM-95-15X	11/15/2023 Result (µg/L)
Arsenic (Dissolved)	7.7
Iron (Dissolved)	1,200
Manganese (Dissolved)	380

ZWM-95-15X

ZWM-01-26X

ZWM-99-23X	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	**23**
Iron (Dissolved)	2,100
Manganese (Dissolved)	1,300

ZWM-99-23X

69W-94-14	11/15/2023 Result (µg/L)
Arsenic (Dissolved)	3.0 U
Iron (Dissolved)	43 J
Manganese (Dissolved)	120

69W-94-14

69W-94-13	11/14/2023 Result (µg/L)
Arsenic (Dissolved)	9.1
Iron (Dissolved)	570
Manganese (Dissolved)	320

69W-94-13

ZWM-99-24X	11/14/2023 Result (µg/L)
Arsenic (Dissolved)	2.7 J
Iron (Dissolved)	630
Manganese (Dissolved)	67

ZWM-99-24X

ZWP-95-01X

69W-94-12

ZWM-99-22X

ZWM-99-22X	11/16/2023 Result (µg/L)
Arsenic (Dissolved)	**110 (120)**
Iron (Dissolved)	11,000 (11,000)
Manganese (Dissolved)	1,000 (1,100)

ZWM-95-16X

Building 215

ZWM-95-17X

Willow Brook

N

Aerial Source: Google Earth, 2019

Legend

- LTM Sample Well
- LTM Sample Well Point
- LTM Well - Gauge Only
- LTM Piezometer
- Parcel Boundary
- Surface Water Course
- Excavated Soils Management Area
- Soil Excavation Limits (1997-1998)
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area

Notes:

Cleanup Goals (µg/L)	
Arsenic (Dissolved)	10
Monitoring Criteria (µg/L)	
Iron (Dissolved)	9,100
Manganese (Dissolved)	375

1. Bold concentrations indicate exceedances of Groundwater Cleanup Goal.
2. AOC 69W lies within the MassDEP Zone II Wellhead Protection Area for the MacPherson well.

ft AMSL = feet above mean sea level
J = estimated value
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NA = not analyzed
U = not detected
µg/L = micrograms per liter

0 200 400
Feet

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Metals Concentrations in Groundwater
AOC 69W
Fall 2023

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Figure 9

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Legend

- Monitoring Well
- Staff Gauge
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on 1999 to 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Area 1
- Former Gasoline UST(s)
- Former Waste Oil UST
- Former Waste Oil AST
- Former UST Area
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area

AST = aboveground storage tank
ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
UST = underground storage tank

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 43G

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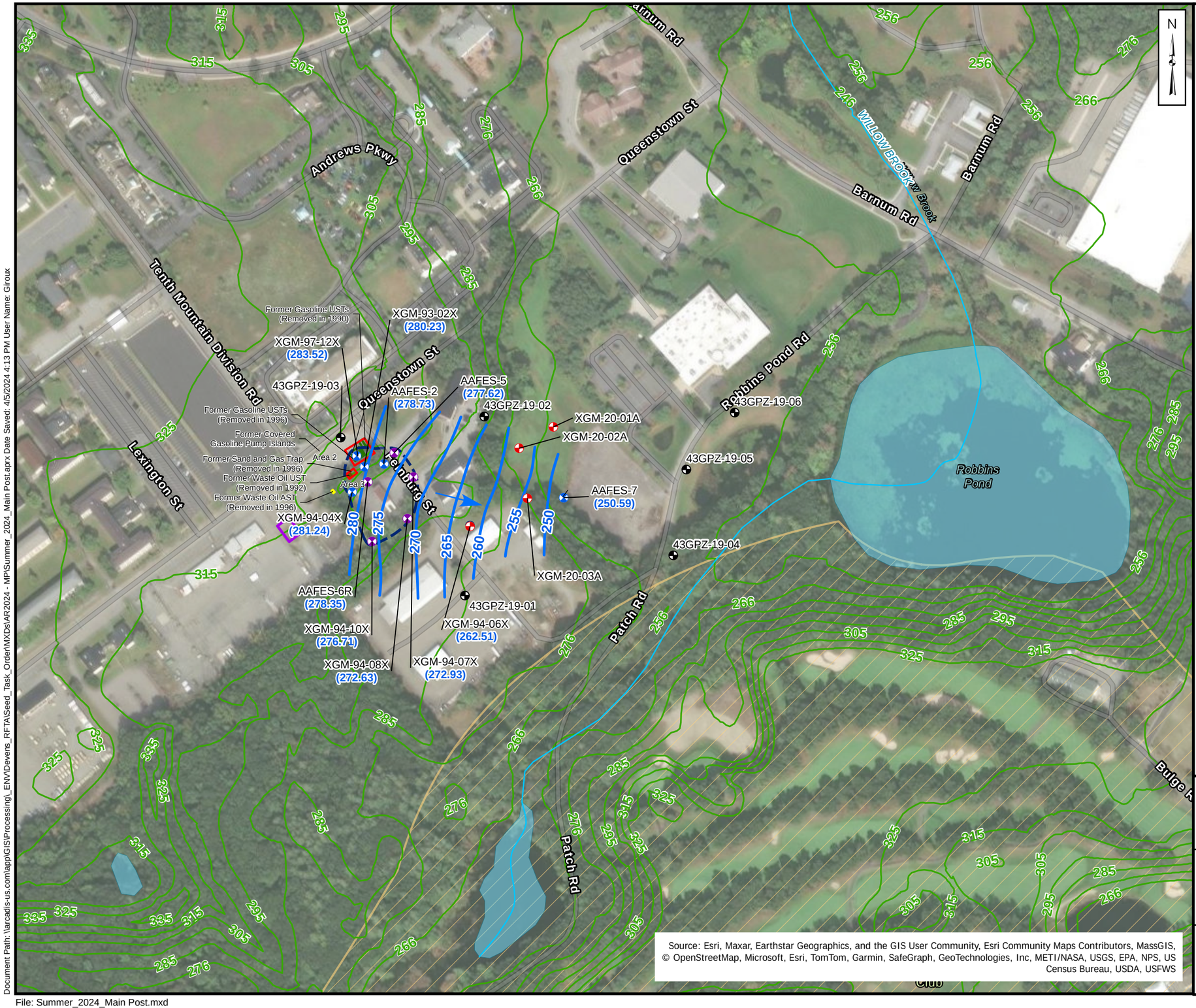
Figure
10



Notes:
AST = aboveground storage tank
ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NAVD88 = North American Vertical Datum of 1988
UST = underground storage tank

0 300 600
Feet

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri Community Maps Contributors, MassGIS, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

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Devens, Massachusetts

Groundwater Elevation Contour Map
AOC 43G
Fall 2023

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Figure 11

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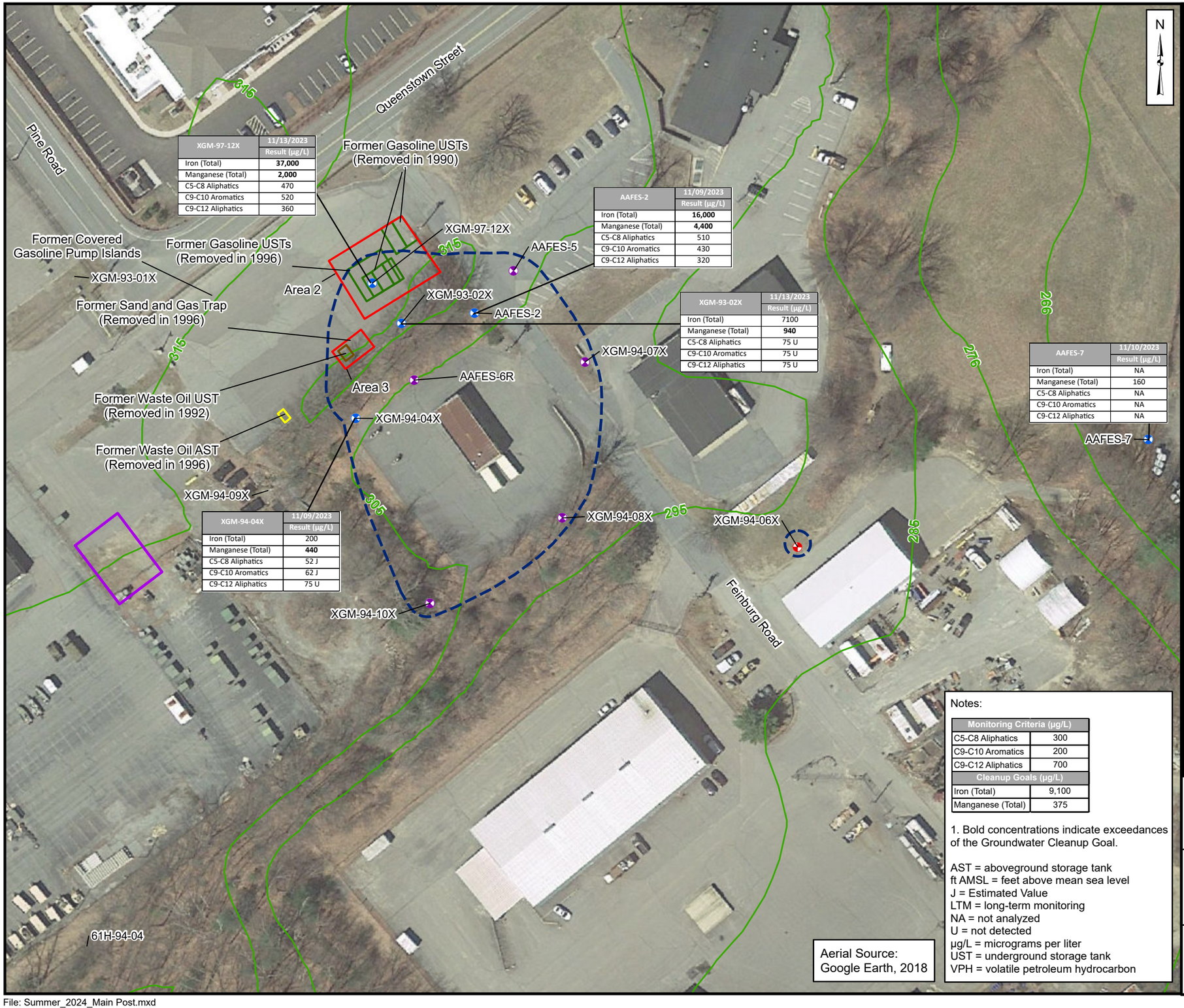

XGM-97-12X	11/13/2023 Result (µg/L)
Iron (Total)	**37,000**
Manganese (Total)	**2,000**
C5-C8 Aliphatics	470
C9-C10 Aromatics	520
C9-C12 Aliphatics	360

AAFES-2	11/09/2023 Result (µg/L)
Iron (Total)	**16,000**
Manganese (Total)	**4,400**
C5-C8 Aliphatics	510
C9-C10 Aromatics	430
C9-C12 Aliphatics	320

XGM-93-02X	11/13/2023 Result (µg/L)
Iron (Total)	7100
Manganese (Total)	**940**
C5-C8 Aliphatics	75 U
C9-C10 Aromatics	75 U
C9-C12 Aliphatics	75 U

AAFES-7	11/10/2023 Result (µg/L)
Iron (Total)	NA
Manganese (Total)	160
C5-C8 Aliphatics	NA
C9-C10 Aromatics	NA
C9-C12 Aliphatics	NA

XGM-94-04X	11/09/2023 Result (µg/L)
Iron (Total)	200
Manganese (Total)	**440**
C5-C8 Aliphatics	52 J
C9-C10 Aromatics	62 J
C9-C12 Aliphatics	75 U

N

Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Monitoring Well
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on 1999 to 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Area 1
- Former Gasoline UST(s)
- Former Waste Oil UST
- Former Waste Oil AST
- Former UST Area
- Topographic Contour (ft AMSL)

0 100 200
Feet

Aerial Source: Google Earth, 2018

Notes:

Monitoring Criteria (µg/L)	
C5-C8 Aliphatics	300
C9-C10 Aromatics	200
C9-C12 Aliphatics	700
Cleanup Goals (µg/L)	
Iron (Total)	9,100
Manganese (Total)	375

1. Bold concentrations indicate exceedances of the Groundwater Cleanup Goal.

AST = aboveground storage tank
ft AMSL = feet above mean sea level
J = Estimated Value
LTM = long-term monitoring
NA = not analyzed
U = not detected
µg/L = micrograms per liter
UST = underground storage tank
VPH = volatile petroleum hydrocarbon

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VPH and Metals Concentrations in Groundwater, AOC 43G
Fall 2023

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Figure 12

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Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Remaining Bedrock Outcrop
- Topographic Contour (ft AMSL)

AST = aboveground storage tank
DRMO = Defense Reutilization and Marketing Office
ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
UST = underground storage tank

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
AOC 32/43A

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Figure
13

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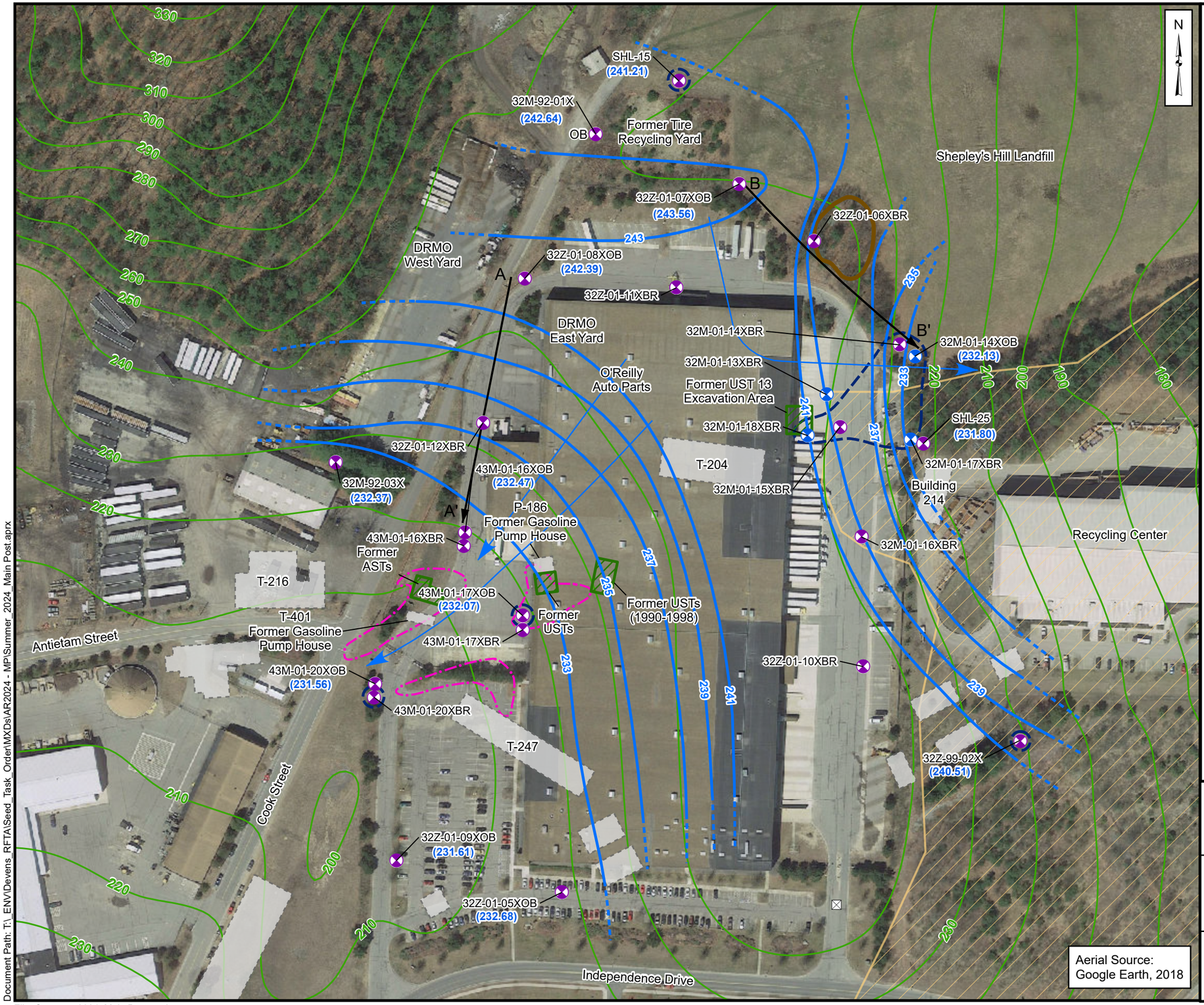

Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- Monitoring Well - Paved Over
- Groundwater Contour (ft NAVD88) (Interval = 2 ft)
- Groundwater Contour (ft NAVD88) (Interval = 2 ft) (Inferred)
- Groundwater Flow Direction
- A——A' Groundwater Gradient Calculation Location
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Bedrock Surface Contour
- (231.80) Groundwater Elevation (ft NAVD88)

AST = aboveground storage tank
DRMO = Defense Reutilization and Marketing Office
ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NAVD88 = North American Vertical Datum of 1988
TPH = total petroleum hydrocarbons
UST = underground storage tank
NM = Not Measured

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Groundwater Elevation Contour Map
Overburden Wells, AOC 32/43A
Spring 2023

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Figure
14

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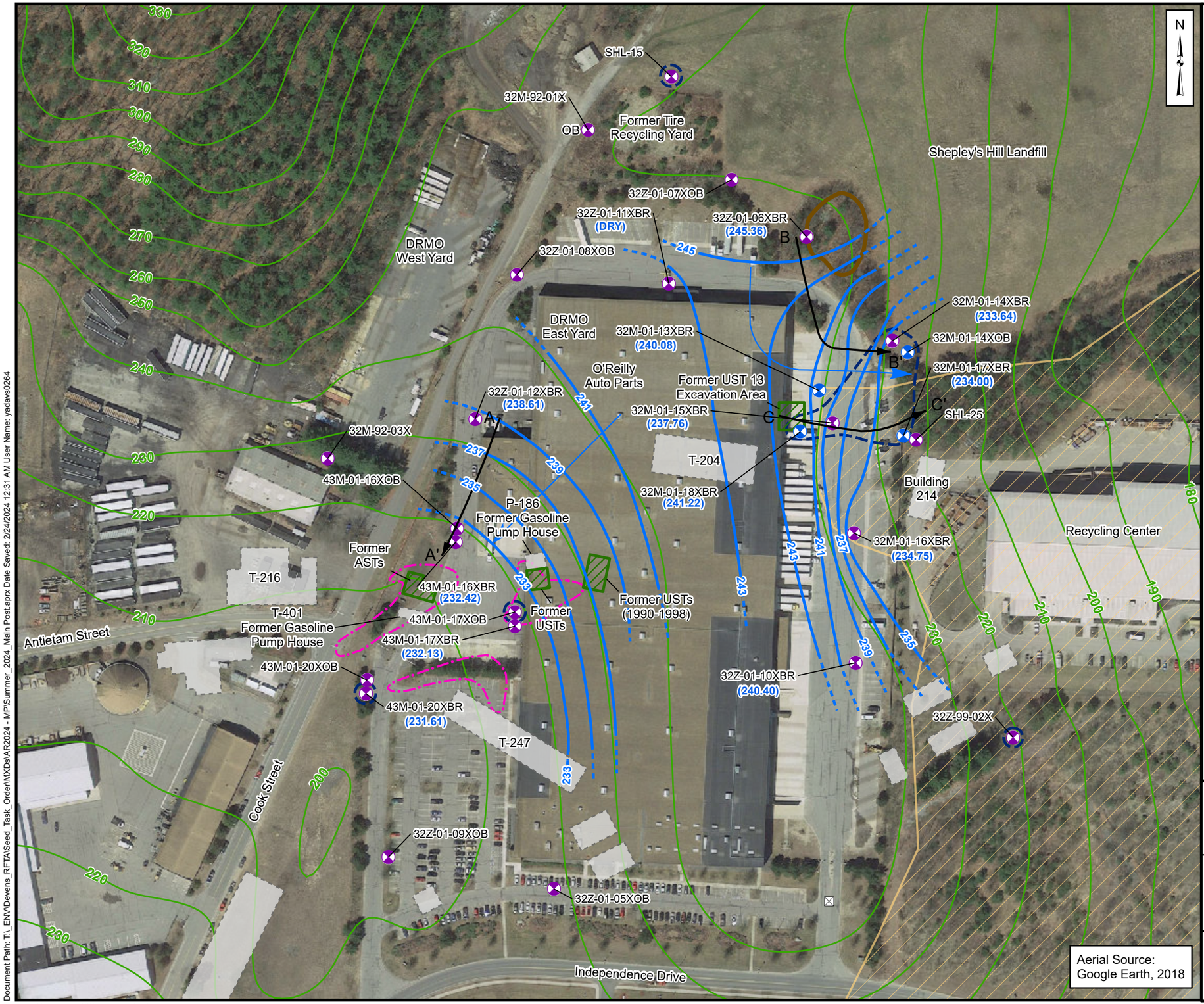

Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- Monitoring Well - Paved Over
- Groundwater Contour (ft NAVD88) (Interval = 2 ft)
- Groundwater Contour (ft NAVD88) (Interval = 2 ft) (Inferred)
- Groundwater Flow Direction
- A——A' Groundwater Gradient Calculation Location
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Bedrock Surface Contour
- (245.36) Groundwater Elevation (ft NAVD88)

ft AMSL = feet above mean sea level
AST = aboveground storage tank
DRMO = Defense Reutilization and Marketing Office
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
NAVD88 = North American Vertical Datum of 1988
TPH = total petroleum hydrocarbons
UST = underground storage tank

0 200 400
Feet

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Devens, Massachusetts

Groundwater Elevation Contour Map
Bedrock Wells, AOC 32/43A
Spring 2023

SERES Preservation & Services, LLC
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Figure 15

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Notes:

Monitoring Criteria	
VPH	**Result (µg/L)**
C9-C10 Aromatics	200
Ethylbenzene	700
VOCs	**Result (µg/L)**
Chlorobenzene	100

Cleanup Goal	
VOCs	**Result (µg/L)**
1,2-Dichlorobenzene	600
1,3-Dichlorobenzene	100
1,4-Dichlorobenzene	5
Metals	**Result (µg/L)**
Arsenic (Total)	10
Manganese (Total)	3,500

1. Bold concentrations indicate exceedances of the Groundwater Cleanup Goal.

AST = aboveground storage tank
DRMO = Defense Reutilization and Marketing Office
ft AMSL = feet above mean sea level
J = estimated value
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection
TPH = total petroleum hydrocarbons
U = non-detect
µg/L = micrograms per liter
UST = underground storage tank
VOCs = volatile organic compounds
VPH = volatile petroleum hydrocarbon

32M-01-13XBR	06/08/2023
	Result (µg/L)
Arsenic (Total)	1.1 J
Manganese (Total)	17
1,2-Dichlorobenzene	1.0 U
1,3-Dichlorobenzene	1.0 U
1,4-Dichlorobenzene	1.0 U
Chlorobenzene	0.5 U
Ethylbenzene	0.5 U
C9-C10 Aromatics	20 U

32M-01-14XOB	06/09/2023
	Result (µg/L)
Arsenic (Total)	**12**
Manganese (Total)	810
1,2-Dichlorobenzene	1.0 U
1,3-Dichlorobenzene	1.0 U
1,4-Dichlorobenzene	1.0 U
Chlorobenzene	0.5 U
Ethylbenzene	0.5 U
C9-C10 Aromatics	20 U

32M-01-18XBR	06/09/2023
	Result (µg/L)
Arsenic (Total)	2.5 J (1.9 J)
Manganese (Total)	1,300 (1,300)
1,2-Dichlorobenzene	1.0 U (0.31 J)
1,3-Dichlorobenzene	1.0 U (1.0 U)
1,4-Dichlorobenzene	1.0 U (1.0 U)
Chlorobenzene	0.5 U (0.5 U)
Ethylbenzene	0.5 U (0.5 U)
C9-C10 Aromatics	20 U (20 U)

32M-01-17XBR	06/07/2023
	Result (µg/L)
Arsenic (Total)	0.94 J
Manganese (Total)	5.9 J
1,2-Dichlorobenzene	1.0 U
1,3-Dichlorobenzene	1.0 U
1,4-Dichlorobenzene	1.0 U
Chlorobenzene	0.5 U
Ethylbenzene	0.5 U
C9-C10 Aromatics	20 U

N

Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Topographic Contour (ft AMSL)

0 200 400
Feet

Aerial Source: Google Earth, 2018

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

VOCs, VPH, and Metals Concentrations in Groundwater, AOC 32/43A
Spring 2023

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Figure 16

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Legend

- Gas Vent
- Monitoring Well - Destroyed
- LTM Sample Well
- LTM Well - Gauge Only
- Landfill Gas Monitoring Well
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area

ft AMSL = feet above mean sea level
LTM = long-term monitoring
MassDEP = Massachusetts Department of Environmental Protection

Note: Monitoring wells LFM-99-01B, LFM-99-02B, LFM-99-03B, and LFM-99-05B are screened in bedrock.

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Layout
Devens Consolidated Landfill

SERES Engineering & Services, LLC
ARCADIS
a joint venture

Figure
17

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Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Gas Vent
- Monitoring Well - Destroyed
- Landfill Gas Monitoring Well
- Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 10 ft)
- Groundwater Flow Direction
- A——A' Groundwater Gradient Calculation Location
- Topographic Contour (ft AMSL)
- Leachate System Building
- MassDEP Zone II Wellhead Protection Area
- (335.38) Groundwater Elevation (ft NAVD88)

ft AMSL = feet above mean sea level
LTM = long-term monitoring
NAVD88 = North American Vertical Datum of 1988

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Groundwater Elevation Contour Map - Bedrock Wells
Devens Consolidated Landfill
Spring 2023

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Figure
18

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Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Gas Vent
- Monitoring Well - Destroyed
- Landfill Gas Monitoring Well
- Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 10 ft)
- Groundwater Flow Direction
- A——A' Groundwater Gradient Calculation Location
- Topographic Contour (ft AMSL)
- Leachate_System_Building
- MassDEP Zone II Wellhead Protection Area
- (297.30) Groundwater Elevation (ft NAVD88)

ft AMSL = feet above mean sea level
LTM = long-term monitoring
NAVD88 = North American Vertical Datum of 1988

0 200 400
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Groundwater Elevation Contour Map - Bedrock Wells
Devens Consolidated Landfill
Fall 2023

SERES Engineering & Services, LLC
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Figure
19

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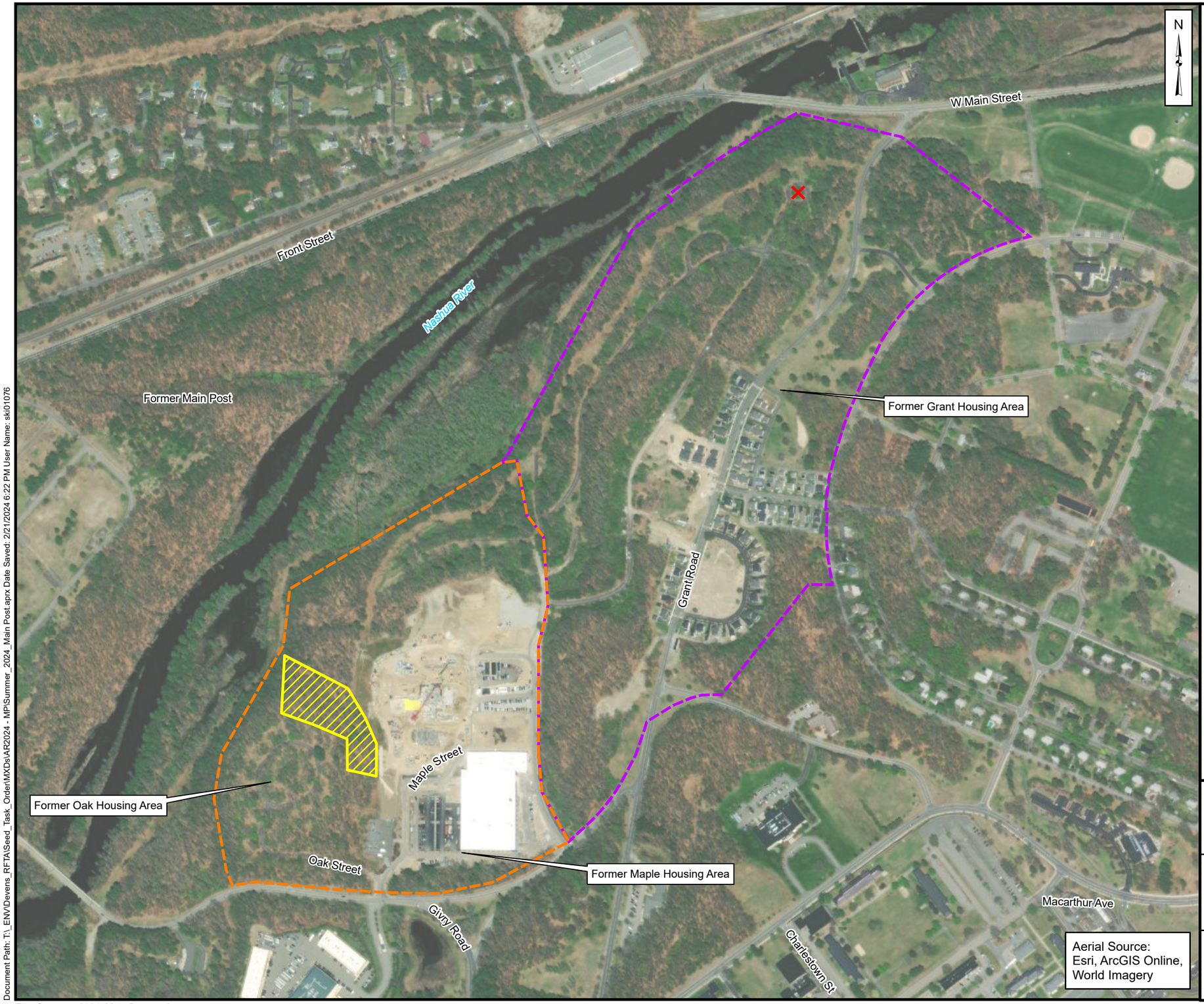

Legend

- Portion of Former Grant Housing Area (Subject to 2009 ROD/2011 LUCIP LUCs)
- Former Oak; Former Maple, and a portion of the Former Grant Housing Area (i.e. Restricted Area) (Subject to 2021 LUCIP Addendum/NAUL/ SSSMP LUCs)
- 37-mm Impact Area
- Approximate Former Firing Location

LUC: Land Use Control
LUCIP: Land Use Control Implementation Plan
NAUL: Notice of Activity and Use Limitation
ROD: Record of Decision
SSMP: Site-Specific Soils Management Plan

0 500 1,000
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Location
Grant Housing Area / Oak and Maple Housing Area / 37-mm Impact Area

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Figure
20

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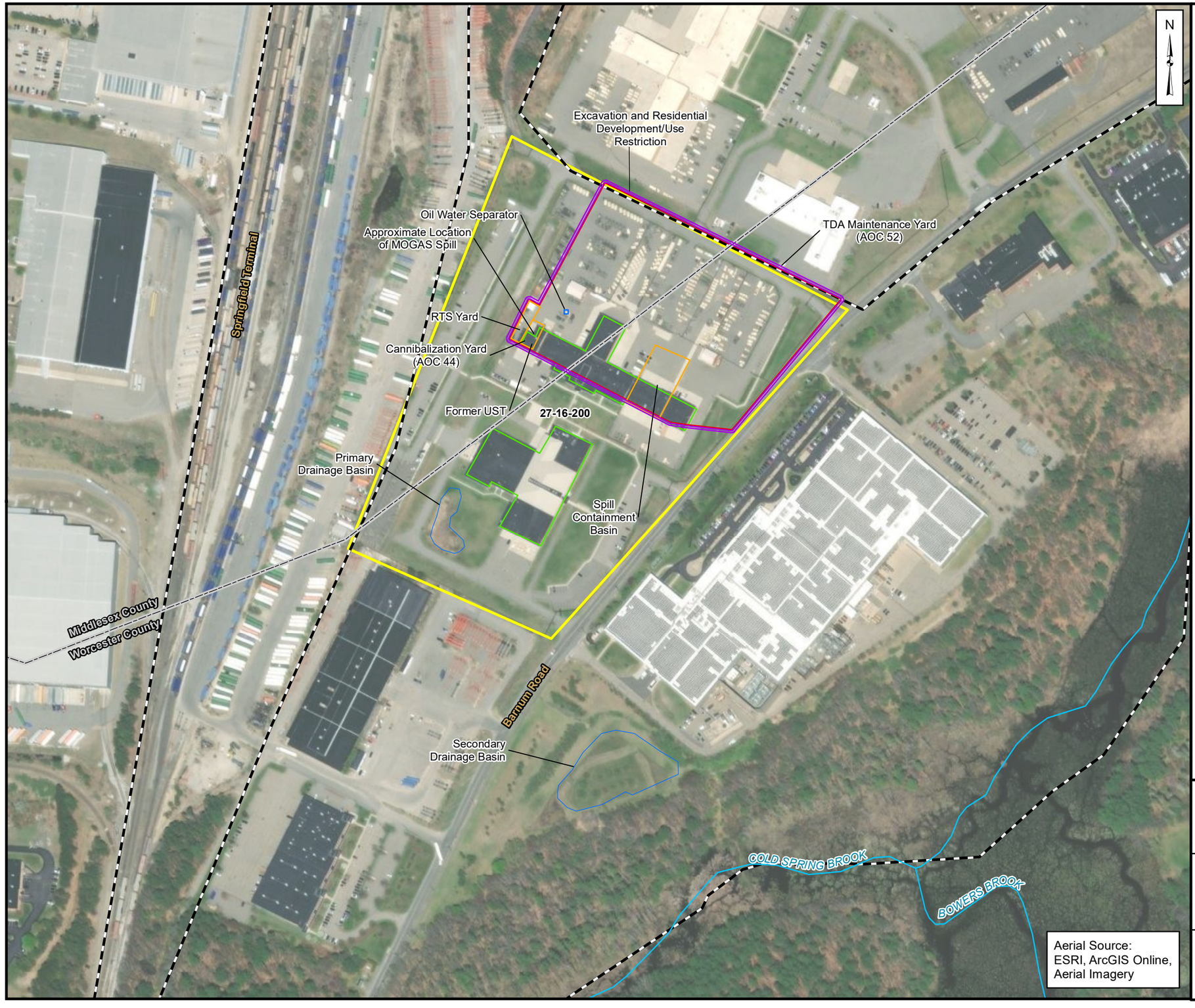

Legend

- Former Fort Devens Boundary
- County Line
- Stream
- Parcel Boundary (Parcel #27-16-200)/Major David S. Connolly Armed Forces Reserve Center
- Maintenance Yard Boundary
- Former Yard or Basin
- Existing Building
- Drainage Basin
- Excavation and Residential Development/Use Restriction

Notes:
1. Boundaries and site features shown on the figure are approximate.
2. Entire area shown on this figure is within a MassDEP Zone II Wellhead Protection Area.

Abbreviations:
AOC = Area of Contamination
MassDEP = Massachusetts Department of Environmental Protection
MOGAS = motor vehicle gasoline
RTS = Regional Training Site
TDA = Table of Distribution and Allowances
UST = underground storage tank

0 300 600
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Location
AOCs 44 and 52
Barnum Road Maintenance Yards

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Figure
21

T:_ENV\Devens_RFTA\Seed_Task_Order\MXDs\Area 1 Phase 2 Work Plan\UPDATE\2023\2023-06-09\Figure 2 - Site Layout.mxd 6/16/2023 11:38:27 AM User Name: yadavs0264

Legend

- Former Fort Devens Boundary
- Parcel Boundary (Parcel #32-99-1800)
- Waterbody
- Excavation Area
- SA 71 Boundary
- Soil Disturbance and Residential Reuse Restriction Boundary

Note:
Boundaries and site features shown on the figure are approximate.

Abbreviation:
SA = Study Area

0 400 800
Feet

2023 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

Site Location
SA 71, Former Railroad Roundhouse

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Figure
22

T:_ENV\Devens_RFTA\Seed_Task_Order\MXDs\AR2023 - SA 71\Figure 2 - SA 71 Site Layout.mxd 6/12/2023 11:06:33 AM User Name: yadavs0264

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Appendix A

Groundwater Field Forms

Groundwater Gauging Log

Client:	USACE	**Date(s):**	06-07-2023 to 06-08-2023
Facility:	Former Fort Devens	**Work Order(s):**	2023 Spring LTM
Facility Location:	Devens, MA, USA	**Area:**	Main Post
Field Technician:	Spencer Gust, Frank Martinez, Grace Sheckler	**Equipment:**	Water Level Meter

Location	Area	Date	Time	Scope of Work Completed?	Depth Below Water Surface (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
57M-03-01X	AOC 57	06-07-2023	--	Yes	14.57	21.14	--	--	
57M-03-02X	AOC 57	06-07-2023	13:32	Yes	5.32	13.74	--	--	
57M-03-03X	AOC 57	06-07-2023	12:20	Yes	1.31	11.60	--	--	
57M-03-04X	AOC 57	06-07-2023	13:21	Yes	2.52	12.64	--	--	
57M-03-05X	AOC 57	06-07-2023	13:41	Yes	2.98	12.24	--	--	
57M-03-06X	AOC 57	06-07-2023	13:52	Yes	2.78	14.25	--	--	
57M-95-03X	AOC 57	06-07-2023	--	Yes	11.17	--	--	--	
57M-95-05X	AOC 57	06-07-2023	11:53	Yes	14.71	22.71	--	--	
57M-95-06X	AOC 57	06-07-2023	11:29	Yes	12.99	24.66	--	--	
57M-95-07X	AOC 57	06-07-2023	12:03	Yes	3.20	14.41	--	--	Locked on arrival. Lock in good shape.
57M-96-10X	AOC 57	06-07-2023	--	Yes	7.15	7.51	--	--	
57M-96-11X	AOC 57	06-07-2023	--	Yes	3.40	--	--	--	
57M-96-12X	AOC 57	06-07-2023	09:53	Yes	5.08	15.24	--	--	Construction depth appears to be from ground level not TOC.
57M-96-13X	AOC 57	06-07-2023	10:02	Yes	4.97	15.00	--	--	Construction depth appears to be taken from ground level not TOC.
57P-98-03X	AOC 57	06-07-2023	10:29	Yes	2.54	7.06	--	--	Construction depth from ground not TOC.
57P-98-04X	AOC 57	06-07-2023	--	Yes	3.32	8.32	--	--	
57WP-05-01	AOC 57	06-07-2023	--	Yes	2.01	--	--	--	
57WP-06-02	AOC 57	06-07-2023	13:13	Yes	1.42	5.00	--	--	
57WP-06-03	AOC 57	06-07-2023	09:13	Yes	0.80	19.87	--	--	
32M 01-13XBR	AOC 32-43A	06-07-2023	12:51	Yes	17.80	23.05	--	--	Flush mount needs bolts
32M-01-14XBR	AOC 32-43A	06-08-2023	14:43	Yes	22.42	46.08	--	--	
32M-01-14XOB	AOC 32-43A	06-08-2023	14:50	Yes	24.43	30.01	--	--	
32M-01-15XBR	AOC 32-43A	06-07-2023	12:35	Yes	20.60	44.15	--	--	
32M-01-16XBR	AOC 32-43A	06-07-2023	12:21	Yes	22.75	31.01	--	--	
32M-01-17XBR	AOC 32-43A	06-07-2023	12:43	Yes	25.11	54.20	--	--	
32M-01-18XBR	AOC 32-43A	06-07-2023	12:40	Yes	17.10	24.40	--	--	
32M-92-01X	AOC 32-43A	06-08-2023	14:08	Yes	17.53	26.10	--	--	
32M-92-03X	AOC 32-43A	06-07-2023	11:04	Yes	27.65	35.57	--	--	
32Z-01-05XOB	AOC 32-43A	06-07-2023	11:41	Yes	28.72	35.20	--	--	
32Z-01-06XBR	AOC 32-43A	06-08-2023	14:29	Yes	16.49	28.75	--	--	
32Z-01-07XOB	AOC 32-43A	06-08-2023	14:24	Yes	15.92	24.92	--	--	
32Z-01-08XOB	AOC 32-43A	06-07-2023	15:57	Yes	18.10	24.39	--	--	
32Z-01-09XOB	AOC 32-43A	06-07-2023	11:31	Yes	25.76	33.22	--	--	
32Z-01-10XBR	AOC 32-43A	06-07-2023	12:04	Yes	17.01	21.35	--	--	
32Z-01-11XBR	AOC 32-43A	06-07-2023	13:42	Yes	DRY	16.99	--	--	
32Z-01-12XBR	AOC 32-43A	06-07-2023	14:15	Yes	19.24	37.65	--	--	
32Z-99-02X	AOC 32-43A	06-07-2023	15:59	Yes	19.20	19.20	--	--	
43M-01-16XBR	AOC 32-43A	06-07-2023	13:11	Yes	24.42	57.04	--	--	
43M-01-16XOB	AOC 32-43A	06-07-2023	14:37	Yes	24.41	33.84	--	--	
43M-01-17XBR	AOC 32-43A	06-07-2023	16:14	Yes	26.16	57.43	--	--	
43M-01-17XOB	AOC 32-43A	06-07-2023	16:23	Yes	26.01	33.10	--	--	
43M-01-20XBR	AOC 32-43A	06-07-2023	14:52	Yes	25.69	77.95	--	--	
43M-01-20XOB	AOC 32-43A	06-07-2023	15:01	Yes	25.84	33.30	--	--	
SHL-15	AOC 32-43A	06-08-2023	14:16	Yes	17.62	26.49	--	--	
SHL-25	AOC 32-43A	06-07-2023	16:09	Yes	26.21	36.33	--	--	
LFM-03-07	DCL	06-07-2023	14:45	Yes	19.63	23.25	--	--	
LFM-99-01B	DCL	06-07-2023	14:18	Yes	25.30	34.43	--	--	
LFM-99-02B	DCL	06-07-2023	14:12	Yes	18.45	26.29	--	--	
LFM-99-03B	DCL	06-07-2023	14:29	Yes	40.87	50.65	--	--	
LFM-99-05A	DCL	06-07-2023	13:40	Yes	22.71	30.80	--	--	
LFM-99-05B	DCL	06-07-2023	13:48	Yes	19.94	58.67	--	--	
LFM-99-06ARP	DCL	06-08-2023	12:35	Yes	15.71	34.91	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume

Gauging Log

Client:	USACE	**Date(s):**	11-02-2023 to 11-06-2023
Facility:	Former Fort Devens	**Work Order(s):**	2023 Fall LTM
Facility Location:	Devens, MA, USA Updated	**Area:**	AOC 43G
Field Technician:	Allyson Fenton, Nelson Martinez, Frank Martinez	**Equipment:**	Water Level Meter

Location	Date	Time	Scope of Work Completed?	Depth to Water(ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
AOC 43G								
AAFES-2	11-06-2023	13:08	Yes	22.99	33.4	--	--	
AAFES-5	11-06-2023	13:07	Yes	22.18	29.92	--	--	
AAFES-6R	11-06-2023	12:20	Yes	20.39	27.01	--	--	
AAFES-7	11-06-2023	14:10	Yes	8.21	17.15	--	--	
XGM-93-02X	11-06-2023	13:42	Yes	28.78	37.46	--	--	
XGM-94-04X	11-06-2023	12:33	Yes	19.45	31.1	--	--	
XGM-94-06X	11-06-2023	13:56	Yes	21.56	30.09	--	--	
XGM-94-07X	11-06-2023	12:46	Yes	21.89	29.78	--	--	
XGM-94-08X	11-06-2023	12:42	Yes	26.35	35.99	--	--	
XGM-94-10X	11-06-2023	12:38	Yes	25.25	33.94	--	--	
XGM-97-12X	11-06-2023	13:27	Yes	25.18	33.76	--	--	
AOC 69W								
69W-94-12	11-02-2023	10:30	Yes	5.96	16.02	--	--	
69W-94-13	11-02-2023	10:21	Yes	4.87	16.26	--	--	
69W-94-14	11-02-2023	09:25	Yes	5.98	15.28	--	--	
69WP-08-01	11-02-2023	10:02	Yes	1.83	12.32	--	--	
69WP-13-01	11-02-2023	11:33	Yes	1.3	12.38	--	--	
Willow Brook PZ	11-02-2023	13:36	Yes	1.68	2.07	--	--	
ZWM 01-25X	11-02-2023	09:39	Yes	4.24	16.06	--	--	
ZWM-01-26X	11-02-2023	09:45	Yes	5.87	16.18	--	--	
ZWM-95-15X	11-02-2023	09:31	Yes	3.97	14.69	--	--	
ZWM-95-16X	11-02-2023	14:46	Yes	3.91	15.53	--	--	
ZWM-95-17X	11-02-2023	08:15	Yes	12.92	16.4	--	--	
ZWM-95-18X	11-02-2023	09:54	Yes	2.47	15.38	--	--	
ZWM-99-22X	11-02-2023	16:07	Yes	3.95	14.32	--	--	
ZWM-99-23X	11-02-2023	10:09	Yes	3.91	15.25	--	--	
ZWM-99-24X	11-02-2023	09:18	Yes	4.02	15.92	--	--	
ZWP-95-01X	11-02-2023	09:09	Yes	4.18	14.44	--	--	
ZWP-95-02X	11-02-2023	11:04	Yes	2.91	14.44	--	--	
DCL								
LFM-03-07	11-03-2023	09:07	Yes	18.95	23.25	--	--	
LFM-99-01B	11-03-2023	08:41	Yes	25.85	34.61	--	--	
LFM-99-02B	11-03-2023	08:49	Yes	18.11	26.28	--	--	
LFM-99-03B	11-03-2023	08:31	Yes	40.06	50.66	--	--	
LFM-99-05A	11-03-2023	08:17	Yes	22.2	30.75	--	--	
LFM-99-05B	11-03-2023	08:21	Yes	19.28	58.5	--	--	
LFM 99-06ARP	11-03-2023	08:05	Yes	15.54	34.92	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume

Groundwater Sampling Form

Location ID:	32M 01-13XBR	**Date(s):**	2023-06-07	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 32-43A
Weather(°F):	CLOUDS, T:61.5 °F, rH:64%, Clouds: 100%, Wind:18.41mph W-NW			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	13.70-23.70	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	18.27	**Total Depth (ft-bmp):**	23.05	**Water Column(ft)**	5.25	**Gallons in Well:**	0.85
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	21	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	15:10	**Total Volume Purged (gallons):**	1.1	**Sample ID:**	32M-01-13XBR-SPR23	**Sample Time:**	NA
Purge End Time:	15:49	**Well Volumes Purged (total):**	1.29	**Replicate Type / Replicate ID:**		**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
15:15	0	125	mL/min	18.27	6.28	5.348	59	57.1	15.5	115	Clear	No Odor
15:20	5	125	mL/min	18.43	6.3	5.352	6.8	5.65	15.6	113.1	Clear	No Odor
15:25	10	125	mL/min	18.87	6.31	5.424	20.1	5.65	15.7	113.6	Clear	No Odor
15:30	15	125	mL/min	18.98	6.32	5.468	18.2	5.59	15.3	113.9	Clear	No Odor
15:35	20	125	mL/min	19.26	6.33	5.478	19.6	5.74	15.4	115.1	Clear	No Odor
15:40	25	125	mL/min	19.5	6.33	5.54	18.6	5.7	15.5	115.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010),Metals (SW6020)	Plastic	1	HNO3
VOCs (SW8260)	Clear Glass	3	HCl
VPH	Clear Glass	3	HCl

Comments: Flush mount - needs bolts. Sampled at 1550

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	32M-01-14XOB	**Date(s):**	2023-06-08	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 32-43A
Weather(°F):	CLOUDS, T:63.37 °F, rH:64%, Clouds: 100%, Wind:9.22mph W			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	17.30-27.30	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	24.71	**Total Depth (ft-bmp):**	30.01	**Water Column(ft)**	5.58	**Gallons in Well:**	0.91
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	28	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:40	**Total Volume Purged (gallons):**	0.5	**Sample ID:**	32M-01-14XOB-SPR23	**Sample Time:**	NA
Purge End Time:	10:14	**Well Volumes Purged (total):**	0.55	**Replicate Type / Replicate ID:**		**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45	0	60	mL/min	24.71	5.87	0.882	30.9	1.78	13.3	106.4	Clear	No Odor
09:50	5	50	mL/min	24.81	5.9	0.886	24.4	1.66	13.8	106.6	Clear	No Odor
09:55	10	50	mL/min	24.89	5.9	0.896	28.8	1.63	13.9	105.9	Clear	No Odor
10:00	15	50	mL/min	24.92	5.92	0.893	26.7	1.58	14.2	104.3	Clear	No Odor
10:05	20	50	mL/min	24.98	5.92	0.894	26.6	1.57	13.9	101.8	Clear	No Odor
10:10	25	50	mL/min	25.05	5.93	0.895	26.7	1.51	13.9	94.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010),Metals (SW6020)	Plastic	1	HNO3
VOCs (SW8260)	Clear Glass	3	HCl
VPH	Clear Glass	3	HCl

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: Well cover broken

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	32M-01-17XBR	**Date(s):**	2023-06-07	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 32-43A
Weather(°F):	CLOUDS, T:61.5 °F, rH:64%, Clouds: 100%, Wind:18.41mph W-NW			**Field Technician:**		Diane Champagne	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	41.40-51.40	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	25.29	**Total Depth (ft-bmp):**	54.2	**Water Column(ft)**	29.09	**Gallons in Well:**	4.73
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	51	**Purge Method:**	Low Flow	**Purging Equipment:**	Portable Bladder
Purge Start Time:	13:00	**Total Volume Purged (gallons):**	2.4	**Sample ID:**	32M-01-17XBR-SPR23	**Sample Time:**	14:05
Purge End Time:	14:00	**Well Volumes Purged (total):**	0.51	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 22B103383
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:05	0	150	mL/min	25.29	7.04	1.26	65.45	3.01	14.3	-48.3	Clear	No Odor
13:15	10	150	mL/min	25.29	6.99	1.301	21.26	0.92	14.2	-43.8	Clear	No Odor
13:20	15	150	mL/min	25.29	7	1.301	21.75	0.8	14.1	-42.7	Clear	No Odor
13:25	20	150	mL/min	25.29	7	1.297	14.53	0.75	14.5	-42.5	Clear	No Odor
13:30	25	150	mL/min	25.29	7	1.296	13.19	0.71	14.8	-43	Clear	No Odor
13:36	31	150	mL/min	25.29	7.01	1.298	9.8	0.68	15	-43.3	Clear	No Odor
13:40	35	150	mL/min	25.29	7.01	1.297	8.02	0.67	14.9	-43.1	Clear	No Odor
13:45	40	150	mL/min	25.29	7.01	1.297	7.17	0.64	14.6	-42.3	Clear	No Odor
13:50	45	150	mL/min	25.29	7.01	1.291	4.46	0.61	14.6	-41.9	Clear	No Odor
13:55	50	150	mL/min	5.29	7.02	1.289	4.43	0.6	14.6	-41.3	Clear	No Odor
14:00	55	150	mL/min	25.29	7.02	1.287	4.27	0.58	14.7	-41.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010),Metals (SW6020)	Plastic	1	HNO3
VOCs (SW8260)	Clear Glass	3	HCl
VPH	Clear Glass	3	HCl

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	32M-01-18XBR	**Date(s):**	2023-06-09	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 32-43A
Weather(°F):	CLOUDS, T:61.47 °F, rH:64%, Clouds: 100%, Wind:18.41mph W-NW			**Field Technician:**		Grace Sheckler	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	14.00-24.00	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	17.68	**Total Depth (ft-bmp):**	24.4	**Water Column(ft)**	7.3	**Gallons in Well:**	1.19
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	20	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:41	**Total Volume Purged (gallons):**	0.45	**Sample ID:**	32M-01-18XBR-SPR23	**Sample Time:**	10:00
Purge End Time:	09:55	**Well Volumes Purged (total):**	0.38	**Replicate Type / Replicate ID:**	**Duplicate** / 32M-DUP01-SPR23	**Water Quality Meter/ ID:**	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45	0	110	mL/min	17.68	6.32	4.295	2.5	3.81	13.7	222.6	Clear	No Odor
09:50	5	110	mL/min	17.8	6.34	4.291	2.2	3.87	13.8	217.5	Clear	No Odor
09:55	10	110	mL/min	17.97	6.35	4.297	2.6	3.86	13.8	214	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010),Metals (SW6020)	Plastic	1	HNO3
VOCs (SW8260)	Clear Glass	3	HCl
VPH	Clear Glass	3	HCl

Comments: Under Bay 28

Well Information:

Well Labeled Properly: no

Is Well in Good Condition? poor

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS a joint venture

Location ID:	57M-95-03X	**Date(s):**	2023-06-07	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 57
Weather(°F):	62 Cloudy. Wind 10mph SE.			**Field Technician:**		Spencer Gust	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	7.00-17.00	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	11.31	**Total Depth (ft-bmp):**	19.7	**Water Column(ft)**	4.53	**Gallons in Well:**	2.94
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	17	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:26	**Total Volume Purged (gallons):**	1.16	**Sample ID:**	57M-95-03X-SPR23	**Sample Time:**	10:08
Purge End Time:	10:07	**Well Volumes Purged (total):**	0.39	**Replicate Type / Replicate ID:**	**MS/MSD** / 57M-DUP01-SPR23	**Water Quality Meter/ ID:**	YSI Pro DSS / 22B103383
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:32	0	110	mL/min	11.31	6.3	0.773	3.62	1.23	11.5	-45.1	Clear	Moderate
09:37	5	110	mL/min	11.31	6.29	0.687	4.1	0.61	11.3	-68.2	Clear	Moderate
09:42	10	110	mL/min	11.31	6.28	0.635	0.68	0.32	11.4	-80	Clear	Moderate
09:47	15	110	mL/min	11.31	6.28	0.616	0.61	0.23	11.5	-90.1	Clear	Moderate
09:54	22	110	mL/min	11.31	6.28	0.618	0.35	0.19	11.7	-97.2	Clear	Moderate
10:00	28	110	mL/min	11.31	6.28	0.618	0.44	0.17	11.6	-101.9	Clear	Moderate
10:06	34	110	mL/min	11.31	6.28	0.615	0.63	0.13	11.9	-105.5	Clear	Moderate

Constituent Sampled	Container	Number	Preservative
Metals (SW6010)	Plastic	1	HNO3
Metals (SW6020)	Plastic	1	HNO3

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: Locked on arrival, lock in good shape.

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	57M-96-11X	**Date(s):**	2023-06-07	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 57
Weather(°F):	60 Overcast.			**Field Technician:**		NA	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	2.00-12.00	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	3.41	**Total Depth (ft-bmp):**	14.84	**Water Column(ft):**	11.24	**Gallons in Well:**	1.83
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	11:10	**Total Volume Purged (gallons):**	0.65	**Sample ID:**	57M-96-11X-SPR23	**Sample Time:**	11:37
Purge End Time:	11:36	**Well Volumes Purged (total):**	0.36	**Replicate Type / Replicate ID:**	**Duplicate** / 57M-DUP01-SPR23	**Water Quality Meter/ ID:**	YSI Pro DSS / 22B103383
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
11:15	0	100	mL/min	3.41	5.57	1.799	34.99	0.86	12.2	29.2	Reddish Brown	No Odor
11:20	5	100	mL/min	3.41	5.6	1.787	25.5	0.42	12.4	22.5	Reddish Brown	No Odor
11:25	10	100	mL/min	3.41	5.63	1.786	3.18	0.29	12.3	16.5	Clear	No Odor
11:30	15	100	mL/min	3.41	5.65	1.786	2.88	0.23	12.2	12.2	Clear	No Odor
11:35	20	100	mL/min	3.41	5.67	1.784	2.61	0.17	12.3	9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010)	Plastic	1	HNO3
Metals (SW6020)	Plastic	1	HNO3

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: Locked on arrival, lock in good shape.

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	57-SW-1	**Date(s):**	2023-06-09	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	AOC 57
Weather(°F):	60, clear sky.			**Field Technician:**		NA	
Measuring Pt. Description:		**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	NA	**Well Casing Material:**	NA
Static Water Level (ft-bmp):	NA	**Total Depth (ft-bmp):**	NA	**Water Column(ft):**	0	**Gallons in Well:**	NA
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	grab	**Purging Equipment:**	bailer
Purge Start Time:	NA	**Total Volume Purged (gallons):**	NA	**Sample ID:**	NA	**Sample Time:**	12:28
Purge End Time:	NA	**Well Volumes Purged (total):**	NA	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
12:28	0		mL/min		5.96	0.856	5.17	5.91	18.4	23.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6010)	Plastic	1	HNO3
Metals (SW6020)	Plastic	1	HNO3

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS a joint venture

Location ID:	LFM-03-07	**Date(s):**	2023-06-08	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	DCL
Weather(°F):	CLOUDS, T:55.29 °F, rH:85%, Clouds: 100%, Wind:0mph N			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	10.90-20.90	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	19.69	**Total Depth (ft-bmp):**	23.23	**Water Column(ft):**	3.54	**Gallons in Well:**	0.58
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	21	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:55	**Total Volume Purged (gallons):**	0.72	**Sample ID:**	LFM-03-07-SPR23	**Sample Time:**	10:40
Purge End Time:	10:38	**Well Volumes Purged (total):**	1.24	**Replicate Type / Replicate ID:**		**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:00	0	90	mL/min	19.75	6.05	1.49	9	7.64	12.6	159.5	Clear	No Odor
10:05	5	90	mL/min	19.74	6.09	1.49	5.49	7.59	12.7	152.3	Clear	No Odor
10:10	10	90	mL/min	19.74	6.12	1.491	1.98	7.63	12.6	151	Clear	No Odor
10:15	15	90	mL/min	19.74	6.14	1.488	0.54	7.51	12.7	151.1	Clear	No Odor
10:20	20	90	mL/min	19.75	6.15	1.49	0.02	7.57	12.7	150.6	Clear	No Odor
10:25	25	90	mL/min	19.74	6.17	1.489	0.74	7.55	12.8	149.8	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: Sampled at 10:40

Well Information:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Well Labeled Properly:	no
Is Well in Good Condition?	good
Well Inspection Comments:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	LFM-99-02B	**Date(s):**	2023-06-08	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	DCL
Weather(°F):	CLOUDS, T:61.39 °F, rH:63%, Clouds: 100%, Wind:12.66mph NW			**Field Technician:**		Grace Sheckler	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	11:45	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	18.59	**Total Depth (ft-bmp):**	26.29	**Water Column(ft):**	7.84	**Gallons in Well:**	1.27
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	21	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:22	**Total Volume Purged (gallons):**	0.5	**Sample ID:**	LFM-99-02B-SPR23	**Sample Time:**	10:45
Purge End Time:	10:41	**Well Volumes Purged (total):**	0.39	**Replicate Type / Replicate ID:**	**MS/MSD** / LFM-99-02B-SPR23	**Water Quality Meter/ ID:**	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:25	0	104	mL/min	18.59	6.14	1.313	1.3	8.81	10.3	217	Clear	No Odor
10:30	5	104	mL/min	18.59	6.11	1.309	1.2	8.86	10.2	220.6	Clear	No Odor
10:35	10	104	mL/min	18.59	6.11	1.311	1.3	8.85	10.2	223.3	Clear	No Odor
10:40	15	104	mL/min	18.59	6.11	1.31	1.3	8.87	10.2	224.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: None

Well Information:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Well Labeled Properly:	yes
Is Well in Good Condition?	good
Well Inspection Comments:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS a joint venture

Location ID:	LFM-99-05A	**Date(s):**	6/7/2023	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	DCL
Weather(°F):	60 Overcast. 10mph SE.			**Field Technician:**		Spencer Gust	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	19.00-28.30	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	22.78	**Total Depth (ft-bmp):**	30.82	**Water Column(ft):**	8.04	**Gallons in Well:**	1.31
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	28	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:05	**Total Volume Purged (gallons):**	0.75	**Sample ID:**	LFM-99-05A-SPR23	**Sample Time:**	10:36
Purge End Time:	10:36	**Well Volumes Purged (total):**	0.57	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:10	0	110	mL/min	22.76	6.21	0.716	7.42	5.6	11.6	192.5	Clear	No Odor
10:15	5	110	mL/min	22.76	6.22	0.699	5.69	5.17	11.3	184.8	Clear	No Odor
10:20	10	110	mL/min	22.76	6.22	0.694	3.36	5.17	11.3	178.4	Clear	No Odor
10:25	15	110	mL/min	22.76	6.24	0.693	2.24	5.13	11.3	172.6	Clear	No Odor
10:30	20	110	mL/min	22.26	6.26	0.693	1.3	5.06	11.2	169.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Comments: None

Well Information:

Well Labeled Properly:	yes
Is Well in Good Condition?	good
Well Inspection Comments:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS a joint venture

Location ID:	LFM 99-06ARP	**Date(s):**	2023-06-08	**Work Order(s):**		2023 Spring LTM	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA	**Area:**	DCL
Weather(°F):	CLOUDS, T:60.64 °F, rH:71%, Clouds: 100%, Wind:3.44mph SW			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	17.50-32.50	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	15.76	**Total Depth (ft-bmp):**	34.91	**Water Column(ft):**	19.2	**Gallons in Well:**	3.12
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	12:45	**Total Volume Purged (gallons):**	1.4	**Sample ID:**	LFM-99-06A-RP-SPR23	**Sample Time:**	13:25
Purge End Time:	13:23	**Well Volumes Purged (total):**	0.45	**Replicate Type / Replicate ID:**		**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
12:50	0	150	mL/min	15.76	6.23	1.722	2.44	7.35	13.4	111.6	Clear	No Odor
12:55	5	150	mL/min	15.76	6.25	1.723	0.72	7.31	13.2	114.8	Clear	No Odor
13:00	10	150	mL/min	15.76	6.26	1.719	1.69	7.34	12.7	114.7	Clear	No Odor
13:05	15	150	mL/min	15.7	6.26	1.715	0.76	7.32	12.9	114.9	Clear	No Odor
13:10	20	150	mL/min	15.76	6.27	1.714	1.19	7.59	12.8	118	Clear	No Odor
13:15	25	150	mL/min	15.76	6.27	1.716	1.15	7.52	12.9	118.3	Clear	No Odor
13:20	30	150	mL/min	15.76	6.28	1.712	1.52	7.5	12.8	119	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Comments: Sampled at 1325

Well Information:

Well Labeled Properly:	yes
Is Well in Good Condition?	good
Well Inspection Comments:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	LFM-99-06ARP	**Date(s):**	2023-11-07	**Work Order(s):**		2023 Fall LTM Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	DCL
Weather(°F):	Overcast 50F			**Field Technician:**		Michael Spaulding	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	17.50-32.50	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	15.59	**Total Depth (ft-bmp):**	34.92	**Water Column(ft):**	19.33	**Liters in Well:**	11.94
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	33.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	08:15	**Total Volume Purged (liters):**	6.8	**Sample ID:**	LFM-99-06ARP-FAL23	**Sample Time:**	08:52
Purge End Time:	08:52	**Well Volumes Purged (total):**	0.57	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
08:17	0	200	mL/min	15.68	6.63	0.78	212	5.02	12.5	166.8	Gray	No Odor
08:22	5	200	mL/min	15.69	6.34	0.716	10.6	5.76	12.5	159.8	Clear	No Odor
08:27	10	200	mL/min	15.72	6.27	0.73	45.8	5.73	12.6	156.3	Clear	No Odor
08:33	16	200	mL/min	15.7	6.3	0.694	90.4	5.74	12.5	154.2	Gray	No Odor
08:37	20	200	mL/min	15.71	6.26	0.683	5.83	5.88	12.5	153.4	Clear	No Odor
08:41	24	200	mL/min	15.71	6.26	0.676	2.73	5.88	12.6	152.8	Clear	No Odor
08:47	30	200	mL/min	15.71	6.26	0.666	1.9	5.89	12.6	152.2	Clear	No Odor
08:51	34	200	mL/min	15.71	6.26	0.658	1.65	5.89	12.5	152.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	LFM-03-07	**Date(s):**	2023-11-07	**Work Order(s):**		Order #4 - 2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	DCL
Weather(°F):	CLOUDS, T:52.52 °F, rH:89%, Clouds: 100%, Wind:3.44mph N			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	10.90-20.90	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	19.32	**Total Depth (ft-bmp):**	23	**Water Column(ft):**	3.68	**Liters in Well:**	2.27
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	20	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:15	**Total Volume Purged (liters):**	4.5	**Sample ID:**	LFM-03-07-FAL23	**Sample Time:**	10:00
Purge End Time:	10:00	**Well Volumes Purged (total):**	1.98	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:20	0	100	mL/min	19.41	6.21	0.935	39.8	4.4	15	201.3	Clear	No Odor
09:25	5	100	mL/min	19.41	6.21	0.935	33.1	4.32	15	210.4	Clear	No Odor
09:30	10	100	mL/min	19.41	6.23	0.937	20.6	4.36	15.1	217.4	Clear	No Odor
09:35	15	100	mL/min	19.41	6.23	0.937	22	4.33	15.1	220.1	Clear	No Odor
09:40	20	100	mL/min	19.41	6.23	0.938	34.8	4.41	15.1	221.7	Clear	No Odor
09:45	25	100	mL/min	19.41	6.24	0.938	36.6	4.31	15.1	224.4	Clear	No Odor
09:50	30	100	mL/min	19.41	6.24	0.939	38.7	4.29	15.2	226.2	Clear	No Odor
09:55	35	100	mL/min	19.41	6.24	0.939	24.4	4.31	15.2	227.4	Clear	No Odor
10:00	40	100	mL/min	19.41	6.24	0.941	27.3	4.42	15.2	228	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	LFM-99-02B	**Date(s):**	2023-11-07	**Work Order(s):**		2023 Fall LTM Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	DCL
Weather(°F):	CLOUDS, T:60.62 °F, rH:74%, Clouds: 40%, Wind:4.61mph N			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	14.50-23.80	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	18.24	**Total Depth (ft-bmp):**	24	**Water Column(ft):**	5.76	**Liters in Well:**	3.56
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	21	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	11:40	**Total Volume Purged (liters):**	3.5	**Sample ID:**	LFM-99-02B-FAL23	**Sample Time:**	12:15
Purge End Time:	12:15	**Well Volumes Purged (total):**	0.98	**Replicate Type / Replicate ID:**	**MS/MSD** / LFM-99-02B-FAL23	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
11:45	0	100	mL/min	18.37	6.28	0.771	17.4	6.03	13.4	211.3	Clear	No Odor
11:50	5	100	mL/min	18.37	6.25	0.76	27.4	5.82	13.3	218.1	Clear	No Odor
11:55	10	100	mL/min	18.37	6.24	0.763	41.1	5.96	13.5	221.4	Clear	No Odor
12:00	15	100	mL/min	18.37	6.24	0.767	29.1	5.99	13.6	225.7	Clear	No Odor
12:05	20	100	mL/min	18.37	6.23	0.773	13	5.93	13.8	228.8	Clear	No Odor
12:10	25	100	mL/min	18.37	6.23	0.769	6.8	6.04	13.6	231.1	Clear	No Odor
12:15	30	100	mL/min	18.37	6.23	0.769	11.1	5.89	13.7	232.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	LFM-99-05A	**Date(s):**	2023-11-07	**Work Order(s):**			Order #4 - 2023 Fall LTM + SRI Sampling
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	DCL
Weather(°F):	CLOUDS, T:56.32 °F, rH:85%, Clouds: 100%, Wind:6.91mph S			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	19.00-28.30	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	22.43	**Total Depth (ft-bmp):**	30.78	**Water Column(ft):**	8.35	**Gallons in Well:**	1.36
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:10	**Total Volume Purged (gallons):**	0.65	**Sample ID:**	LFM-99-05A-FAL23	**Sample Time:**	10:35
Purge End Time:	10:34	**Well Volumes Purged (total):**	0.48	**Replicate Type / Replicate ID:**	**Duplicate** / DCL-DUP01-FAL23	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:15	0	115	mL/min	22.44	6.38	0.582	9.1	5.99	12.2	202.7	Clear	No Odor
10:20	5	115	mL/min	22.46	6.31	0.576	4.9	5.46	12.2	209.6	Clear	No Odor
10:25	10	115	mL/min	22.46	6.3	0.575	2.8	5.39	12.1	212	Clear	No Odor
10:30	15	115	mL/min	22.46	6.29	0.575	2.1	5.4	12.1	213.7	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
OC Pest (SW8081B)	Amber Glass	2	None
Metals (SW6020)	Plastic	1	HNO3
Metals (SW6010)	Plastic	1	HNO3
Metals (SW7470A)	Plastic	1	HNO3
GenChem (SM2540C)	Plastic	1	None
Anions (SW9056A)	Plastic	1	None
Anions (E353.2)	Amber Glass	1	H2SO4
GenChem (A2320)	Plastic	1	None
GenChem (SW9012)	Plastic	1	NAOH
GenChem (E410.4)	Plastic	1	H2SO4

Comments: Sampled at 10:35

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	AAFES-2	**Date(s):**	2023-11-10	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 43G
Weather(°F):	CLEAR, T:42.98 °F, rH:89%, Clouds: 0%, Wind:1.99mph W-NW			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	16.20-31.20	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	23.4	**Total Depth (ft-bmp):**	31	**Water Column(ft):**	7.6	**Liters in Well:**	4.7
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	27	**Purge Method:**	Low Flow	**Purging Equipment:**	Portable Bladder
Purge Start Time:	09:05	**Total Volume Purged (liters):**	4.2	**Sample ID:**	AAFES-2-FAL23	**Sample Time:**	09:40
Purge End Time:	09:40	**Well Volumes Purged (total):**	0.89	**Replicate Type / Replicate ID:**	**Duplicate** / AOC43G_DUP01-FAL23	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cmᶜ)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:10	0	120	mL/min	23.35	6.45	2.028	24.5	0.18	12.2	-78.4	Clear	Moderate
09:15	5	120	mL/min	23.35	6.46	2.038	21.5	0.11	12.3	-78.9	Clear	Moderate
09:20	10	120	mL/min	23.35	6.48	2.032	19.6	0.07	12.2	-80.7	Clear	Moderate
09:25	15	120	mL/min	23.35	6.48	2.039	17.7	0.05	12.2	-81.5	Clear	Moderate
09:30	20	120	mL/min	23.35	6.45	2.05	17.6	0.07	12.4	-79.4	Clear	Moderate
09:35	25	120	mL/min	23.35	6.45	2.062	15.4	0.06	12.7	-77.7	Clear	Moderate
09:40	30	120	mL/min	23.35	6.45	2.06	14.2	0.06	12.7	-76.7	Clear	Moderate

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS
a joint venture

Location ID:	AAFES-7	**Date(s):**	2023-11-10	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 43G
Weather(°F):	40 F overcast			**Field Technician:**		Michael Spaulding	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	4.50-14.50	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	8.32	**Total Depth (ft-bmp):**	17.15	**Water Column(ft):**	8.83	**Liters in Well:**	5.45
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	16.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:03	**Total Volume Purged (liters):**	4	**Sample ID:**	AAFES-7 -FAL23	**Sample Time:**	10:25
Purge End Time:	10:24	**Well Volumes Purged (total):**	0.73	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:03	0	200	mL/min	8.5	6.68	1.077	57.9	5.49	12.5	145.2	Clear	No Odor
10:07	4	200	mL/min	8.52	6.23	1.053	10.9	4.35	12.8	146.8	Clear	No Odor
10:11	8	200	mL/min	8.52	6.15	1.06	6.41	3.82	12.8	148	Clear	No Odor
10:15	12	200	mL/min	8.52	6.13	1.058	2.93	3.59	12.8	148.7	Clear	No Odor
10:19	16	200	mL/min	8.52	6.13	1.053	3.42	3.49	12.8	149.2	Clear	No Odor
10:23	20	200	mL/min	8.52	6.12	1.051	4.48	3.48	12.7	149.8	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	XGM-93-02X	**Date(s):**	2023-11-13	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	AOC 43G
Weather(°F):	CLEAR, T:37.92 °F, rH:59%, Clouds: 0%, Wind:1.01mph N-NE			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	28.00-39.00	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	29.08	**Total Depth (ft-bmp):**	39	**Water Column(ft):**	9.92	**Liters in Well:**	24.49
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	36	**Purge Method:**	Low Flow	**Purging Equipment:**	Portable Bladder
Purge Start Time:	11:12	**Total Volume Purged (liters):**	6.88	**Sample ID:**	XGM-93-02X-FAL23	**Sample Time:**	12:00
Purge End Time:	11:55	**Well Volumes Purged (total):**	0.28	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
11:15	0	160	mL/min	29.08	6.51	2.665	1.23	1.76	10.6	-30.8	Clear	No Odor
11:20	5	160	mL/min	29.23	6.46	2.602	0.26	1.09	11.4	-32.1	Clear	Strong
11:25	10	160	mL/min	29.49	6.44	2.632	0.01	0.6	11.1	-32.7	Clear	No Odor
11:30	15	160	mL/min	29.68	6.44	2.613	0.2	0.52	11.1	-32.8	Clear	No Odor
11:35	20	160	mL/min	29.83	6.43	2.578	0.01	0.42	11.4	-33.2	Clear	Strong
11:40	25	160	mL/min	29.99	6.43	2.566	0.14	0.37	11.2	-33.3	Clear	No Odor
11:46	31	160	mL/min	29.99	6.43	2.554	0.35	0.33	11	-33.5	Clear	Strong
11:55	40	160	mL/min	29.98	6.42	2.539	0.27	0.2	11.3	-33.7	Clear	Strong

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? poor

Issues: Flushmount - Bolts Needed,Flushmount - Bolts Need Replacement,Flushmount - Bolt Eyelets Not Useable,Flushmount - Gasket Not Present

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	XGM-94-04X	**Date(s):**	2023-11-09	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 43G
Weather(°F):	SNOW, T:34.02 °F, rH:87%, Clouds: 100%, Wind:1.01mph E-NE			**Field Technician:**		Diane Champagne	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	20.50-30.50	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	19.53	**Total Depth (ft-bmp):**	30	**Water Column(ft):**	10.47	**Liters in Well:**	37.21
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	26	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:20	**Total Volume Purged (liters):**	19	**Sample ID:**	XGM-94-04X-FAL23	**Sample Time:**	10:55
Purge End Time:	10:57	**Well Volumes Purged (total):**	0.51	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:25	0	200	mL/min	19.55	6.49	2.761	11.1	1.87	8.1	31.2	Clear	No Odor
09:30	5	200	mL/min	19.62	6.68	2.738	6.45	1.29	8	31.2	Clear	No Odor
09:35	10	200	mL/min	19.69	6.76	2.705	8.54	1.03	8.3	31.4	Clear	No Odor
09:40	15	200	mL/min	19.76	7.78	2.718	2.83	1	7.9	31.3	Clear	No Odor
09:50	25	200	mL/min	19.83	6.83	2.791	0.19	1.11	5.3	30.5	Clear	No Odor
09:55	30	200	mL/min	19.83	6.81	2.69	1.14	0.87	7.3	30.4	Clear	No Odor
10:00	35	200	mL/min	19.83	6.81	2.69	4.94	0.8	8	31.2	Clear	No Odor
10:05	40	200	mL/min	19.83	6.83	2.691	4.67	0.76	7.9	31.3	Clear	No Odor
10:10	45	200	mL/min	19.82	6.83	2.666	0.63	0.75	8.4	31.2	Clear	No Odor
10:15	50	200	mL/min	19.83	6.84	2.685	0.32	0.72	7.9	30.9	Clear	No Odor
10:20	55	200	mL/min	19.83	6.85	2.681	0.01	0.73	8	30.8	Clear	No Odor
10:25	60	200	mL/min	19.84	6.86	2.74	0.18	0.7	8.2	30.9	Clear	No Odor
10:30	65	200	mL/min	19.83	6.86	2.689	0.52	0.74	8.3	30.7	Clear	No Odor
10:35	70	200	mL/min	19.83	6.87	2.694	0.72	0.76	7.9	30.6	Clear	No Odor
10:40	75	200	mL/min	19.83	6.87	2.65	0.31	0.62	8.4	30.7	Clear	No Odor
10:45	80	200	mL/min	19.83	6.87	2.656	0.45	0.69	8.3	30.6	Clear	No Odor
10:50	85	200	mL/min	19.83	6.87	2.646	0.94	0.65	8.3	30.6	Clear	No Odor
10:55	90	200	mL/min	19.83	6.87	2.642	0.88	0.65	8.1	30.3	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Comments: None

Well Information:

Well Labeled Properly:	yes
Is Well in Good Condition?	good
Well Inspection Comments:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	XGM-97-12X	**Date(s):**	2023-11-13	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	AOC 43G
Weather(°F):	CLEAR, T:32.05 °F, rH:72%, Clouds: 0%, Wind:1.01mph N-NW			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	24.00-34.00	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	25.73	**Total Depth (ft-bmp):**	34	**Water Column(ft):**	8.27	**Liters in Well:**	20.44
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	32	**Purge Method:**	Low Flow	**Purging Equipment:**	Portable Bladder
Purge Start Time:	09:15	**Total Volume Purged (liters):**	5.64	**Sample ID:**	XGM-97-12X-FAL23	**Sample Time:**	09:50
Purge End Time:	09:46	**Well Volumes Purged (total):**	0.27	**Replicate Type / Replicate ID:**	**Duplicate** / XGM-97-12X-FAL23	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:20	0	225	mL/min	25.73	6.79	3.881	1.91	0.79	13.1	-34.3	Clear	No Odor
09:25	5	225	mL/min	25.97	6.89	3.052	1.53	0.38	13.7	-36.6	Clear	No Odor
09:30	10	225	mL/min	26.13	6.79	2.711	1.87	0.3	13.5	-37.7	Clear	No Odor
09:35	15	225	mL/min	26.26	6.78	2.628	1.93	0.28	13.8	-38	Clear	No Odor
09:40	20	225	mL/min	26.38	6.78	2.565	2.08	0.24	14.1	-38.6	Clear	No Odor
09:45	25	2.25	mL/min	26.48	6.79	2.558	1.86	0.22	13.8	-38.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS
a joint venture

Location ID:	69W-94-13	**Date(s):**	2023-11-14	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	CLOUDS, T:44.17 °F, rH:72%, Clouds: 75%, Wind:6.91mph W-NW			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	3.00-13.00	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	5.28	**Total Depth (ft-bmp):**	13	**Water Column(ft):**	7.72	**Liters in Well:**	4.77
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	11	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	11:30	**Total Volume Purged (liters):**	10	**Sample ID:**	69W-94-13-FAL23	**Sample Time:**	12:25
Purge End Time:	12:22	**Well Volumes Purged (total):**	2.09	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
11:35	0	200	mL/min	5.28	6.78	2.496	2.29	1.76	13.3	-30.5	Clear	No Odor
11:40	5	200	mL/min	5.32	6.82	2.322	0.83	1.52	13.3	-31.2	Clear	No Odor
11:50	15	200	mL/min	5.31	6.82	2.181	0.51	1.4	13.7	-31.8	Clear	No Odor
11:55	20	200	mL/min	5.31	6.82	2.129	0.53	1.36	13.3	-32	Clear	No Odor
12:00	25	200	mL/min	5.32	6.82	2.117	0.45	1.33	13.2	-32.1	Clear	No Odor
12:05	30	200	mL/min	5.52	6.81	2.086	0.48	1.29	13.7	-32.3	Clear	No Odor
12:10	35	200	mL/min	5.31	6.81	2.06	0.49	1.23	14.6	-32.9	Clear	No Odor
12:15	40	200	mL/min	5.32	6.81	2.052	0.92	1.2	14.2	-33.2	Clear	No Odor
12:20	45	200	mL/min	5.32	6.8	2.068	0.91	1.14	14.2	-33.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

SERES Engineering & Services, LLC
ARCADIS a joint venture

Location ID:	69W-94-14	**Date(s):**	2023-11-15	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	AOC 69W
Weather(°F):	CLEAR, T:41.81 °F, rH:72%, Clouds: 0%, Wind:4.61mph SE			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	3.00-13.00	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	6.48	**Total Depth (ft-bmp):**	13	**Water Column(ft):**	6.52	**Liters in Well:**	4.01
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	11	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	08:55	**Total Volume Purged (liters):**	10	**Sample ID:**	69W-94-14 -FAL23	**Sample Time:**	9:45
Purge End Time:	09:47	**Well Volumes Purged (total):**	2.49	**Replicate Type / Replicate ID:**		**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:00	0	200	mL/min	6.48	5.88	2.08	7.27	4.91	10.6	-28.8	Clear	No Odor
09:10	10	200	mL/min	6.48	5.88	1.896	3.1	2.88	11.4	-28.5	Clear	No Odor
09:15	15	200	mL/min	6.49	5.9	1.814	1.86	2.32	11.5	-29.2	Clear	No Odor
09:20	20	200	mL/min	6.49	5.9	1.738	0.81	2.05	11.4	-29.5	Clear	No Odor
09:25	25	200	mL/min	6.49	5.9	1.7	1.04	1.98	11.9	-29.5	Clear	No Odor
09:30	30	200	mL/min	6.5	5.9	1.699	0.73	1.88	11.5	-29.8	Clear	No Odor
09:35	35	200	mL/min	6.5	5.91	1.67	0.61	1.87	11.8	-29.8	Clear	No Odor
09:40	40	200	mL/min	6.5	5.91	1.651	0.49	1.82	12	-29.8	Clear	No Odor
09:45	45	200	mL/min	6.5	5.9	1.635	0.46	1.78	11.9	-29.8	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	69WP-08-01	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	CLEAR, T:59.7 °F, rH:47%, Clouds: 1%, Wind:4mph W-NW			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	10.00-13.00	**Casing Diameter (in):**	1.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	2.56	**Total Depth (ft-bmp):**	13	**Water Column(ft):**	10.44	**Gallons in Well:**	0.42
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	12	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	12:45	**Total Volume Purged (gallons):**	2.25	**Sample ID:**	69WP-08-01-FAL23-SRI	**Sample Time:**	14:00
Purge End Time:	13:59	**Well Volumes Purged (total):**	5.35	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
12:50	0	120	mL/min	2.56	6.45	1.452	80.2	3.93	13	-20	Clear	No Odor
12:55	5	120	mL/min	2.59	6.56	1.476	61.3	2.01	13.1	-53.7	Clear	No Odor
13:00	10	120	mL/min	2.56	6.54	1.486	35	1.59	13.4	-61.3	Clear	No Odor
13:05	15	120	mL/min	2.59	6.49	1.479	30.4	1.47	13.2	-57.3	Clear	No Odor
13:10	20	120	mL/min	2.56	6.44	1.47	24.3	1.41	13.3	-50.3	Clear	No Odor
13:15	25	120	mL/min	2.56	6.41	1.478	22.3	1.3	13.3	-45	Clear	No Odor
13:20	30	120	mL/min	2.56	6.39	1.472	13.5	1.36	13.3	-41.4	Clear	No Odor
13:25	35	120	mL/min	2.57	6.37	1.456	11.3	1.36	13.2	-37	Clear	No Odor
13:30	40	120	mL/min	2.57	6.34	1.463	7.15	1.36	13.4	-32.3	Clear	No Odor
13:35	45	120	mL/min	2.56	6.33	1.472	8.3	1.38	13.1	-28.8	Clear	No Odor
13:40	50	120	mL/min	2.56	6.32	1.463	7.4	1.37	13.3	-27	Clear	No Odor
13:45	55	120	mL/min	2.56	6.3	1.469	6.6	1.38	13.4	-23.5	Clear	No Odor
13:50	60	120	mL/min	2.56	6.3	1.466	6.3	1.38	13.4	-24.3	Clear	No Odor
13:55	65	120	mL/min	2.56	6.27	1.468	6.1	1.42	13.4	-18.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	69WP-13-01	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	60 F clear			**Field Technician:**		Michael Spaulding	
Measuring Pt. Description:	Top of Outer Casing	**Screen Setting (ft-bgs):**	10.00-13.00	**Casing Diameter (in):**	1.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	1.33	**Total Depth (ft-bmp):**	12.4	**Water Column(ft):**	11.07	**Liters in Well:**	1.71
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	11	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	13:49	**Total Volume Purged (liters):**	18.6	**Sample ID:**	69WP-13-01-FAL23	**Sample Time:**	15:23
Purge End Time:	15:22	**Well Volumes Purged (total):**	10.88	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:49	0	200	mL/min	2.97	6.14	0.705	850	2.6	13.7	7	Black	No Odor
13:53	4	200	mL/min	3.41	6.26	0.703	351	0.31	13.5	-36	Black	No Odor
13:57	8	200	mL/min	4.18	6.46	0.698	1000	0.02	13.6	-57.8	Black	No Odor
14:01	12	200	mL/min	4.31	6.34	0.695	1000	0.34	13.5	-57.4	Black	No Odor
14:06	17	200	mL/min	4.35	6.34	0.694	83.7	0.36	13.5	-46.5	Black	No Odor
14:11	22	200	mL/min	4.38	6.31	0.695	79.7	0.85	13.4	-42.8	Gray	No Odor
14:16	27	200	mL/min	4.36	6.31	0.698	103	0.77	13.4	-42.7	Gray	No Odor
14:21	32	200	mL/min	4.36	6.3	0.699	75.2	0.93	13.4	-40.2	Gray	No Odor
14:25	36	200	mL/min	4.33	6.3	0.7	47.1	1	13.4	-38.7	Gray	No Odor
14:29	40	200	mL/min	4.33	6.29	0.702	33.8	1.05	13.4	-37.4	Gray	No Odor
14:33	44	200	mL/min	4.33	6.29	0.704	27.9	1.11	13.4	-35.7	Clear	No Odor
14:37	48	200	mL/min	4.33	6.29	0.704	20	1.15	13.4	-34.6	Clear	No Odor
14:41	52	200	mL/min	4.33	6.29	0.706	15	1.17	13.4	-33.8	Clear	No Odor
14:45	56	200	mL/min	4.33	6.29	0.706	13.3	1.21	13.4	-32.7	Clear	No Odor
14:49	60	200	mL/min	4.33	6.28	0.708	13.3	1.24	13.4	-31.3	Clear	No Odor
14:53	64	200	mL/min	4.33	6.29	0.708	11	1.27	13.4	-30.1	Clear	No Odor
14:57	68	200	mL/min	4.33	6.28	0.71	11.2	1.3	13.4	-28.8	Clear	No Odor
15:01	72	200	mL/min	4.33	6.28	0.71	9.4	1.31	13.3	-28	Clear	No Odor
15:05	76	200	mL/min	4.33	6.28	0.711	6.28	1.34	13.3	-27	Clear	No Odor
15:09	80	200	mL/min	4.33	6.28	0.712	5.9	1.36	13.4	-26	Clear	No Odor
15:13	84	200	mL/min	4.33	6.28	0.713	5.57	1.37	13.4	-25.1	Clear	No Odor
15:16	87	200	mL/min	4.33	6.28	0.714	4.97	1.36	13.3	-24.5	Clear	No Odor
15:19	90	200	mL/min	4.33	6.28	0.714	4.42	1.39	13.3	-24	Clear	No Odor
15:22	93	200	mL/min	4.33	6.28	0.715	3.13	1.4	13.3	-23.3	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: no

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM 01-25X	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	45F Clear			**Field Technician:**		Michael Spaulding	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	6.13-16.13	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.51	**Total Depth (ft-bmp):**	16.15	**Water Column(ft):**	11.64	**Liters in Well:**	7.19
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	15.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	09:49	**Total Volume Purged (liters):**	9.2	**Sample ID:**	ZWM 01-25X-FAL23	**Sample Time:**	10:36
Purge End Time:	10:36	**Well Volumes Purged (total):**	1.28	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:49	0	200	mL/min	4.58	6.58	0.282	25.5	5.63	13.5	12.3	Clear	No Odor
09:54	5	200	mL/min	4.58	5.82	0.531	2.37	2.39	13.7	58.9	Clear	No Odor
09:58	9	200	mL/min	4.58	5.79	0.532	2.58	2.17	13.8	73.5	Clear	No Odor
10:02	13	200	mL/min	4.58	5.78	0.545	3.62	1.86	13.7	84.8	Clear	No Odor
10:06	17	200	mL/min	4.58	5.78	0.557	2.79	1.63	13.6	91.4	Clear	No Odor
10:10	21	200	mL/min	4.58	5.78	0.57	3.41	1.4	13.6	97.4	Clear	No Odor
10:15	26	200	mL/min	4.58	5.78	0.585	4.7	1.19	13.6	102.6	Clear	No Odor
10:19	30	200	mL/min	4.58	5.78	0.592	4.47	1.06	13.6	105.3	Clear	No Odor
10:23	34	200	mL/min	4.58	5.78	0.597	4.56	0.96	13.6	107.3	Clear	No Odor
10:27	38	200	mL/min	4.58	5.78	0.602	4.38	0.89	13.7	109.1	Clear	No Odor
10:31	42	200	mL/min	4.58	5.79	0.603	4.28	0.85	13.7	110.7	Clear	No Odor
10:35	46	200	mL/min	4.58	5.79	0.603	3.61	0.83	13.7	111.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM-95-15X	**Date(s):**	2023-11-15	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA, USA Updated	**Area:**	AOC 69W
Weather(°F):	CLEAR, T:41.83 °F, rH:72%, Clouds: 0%, Wind:4.61mph SE			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	5.87-15.87	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.28	**Total Depth (ft-bmp):**	15.87	**Water Column(ft):**	11.59	**Liters in Well:**	7.15
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	13.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:20	**Total Volume Purged (liters):**	14	**Sample ID:**	ZWM-95-15X-FAL23	**Sample Time:**	11:35
Purge End Time:	11:34	**Well Volumes Purged (total):**	1.96	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:30	0	200	mL/min	4.28	6.04	0.508	11.68	1.09	9.9	-29.4	Clear	No Odor
10:40	10	200	mL/min	4.28	6.01	0.514	9.39	0.69	10.4	-29.5	Clear	No Odor
10:45	15	200	mL/min	4.28	6.01	0.515	7.71	0.58	10.7	-29.9	Clear	No Odor
10:50	20	200	mL/min	4.5	6.01	0.523	6.05	0.53	10.5	-30.3	Clear	No Odor
10:55	25	200	mL/min	4.5	6	0.524	6.88	0.51	10.6	-30.3	Clear	No Odor
11:00	30	200	mL/min	4.5	6	0.526	5.97	0.49	10.7	-30.3	Clear	No Odor
11:10	40	200	mL/min	4.5	5.99	0.527	5.16	0.46	10.7	-30.3	Clear	No Odor
11:15	45	200	mL/min	4.51	5.99	0.528	4.91	0.44	10.8	-30.3	Clear	No Odor
11:20	50	200	mL/min	4.49	5.99	0.527	4.41	0.43	10.4	-30.3	Clear	No Odor
11:25	55	200	mL/min	4.5	5.98	0.526	4.73	0.43	10.4	-30.3	Clear	No Odor
11:30	60	200	mL/min	4.49	5.98	0.522	4.17	0.42	10.6	-30.3	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM-95-18X	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	CLEAR, T:54.55 °F, rH:55%, Clouds: 0%, Wind:4mph NW			**Field Technician:**		Frank Martinez	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	5.22-15.22	**Casing Diameter (in):**	4.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	2.75	**Total Depth (ft-bmp):**	15.22	**Water Column(ft):**	12.47	**Gallons in Well:**	8.14
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	15	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:45	**Total Volume Purged (gallons):**	1.15	**Sample ID:**	ZWM-95-18X-FAL23-SRI	**Sample Time:**	11:25
Purge End Time:	11:24	**Well Volumes Purged (total):**	0.14	**Replicate Type / Replicate ID:**	**MS/MSD** / ZWM-95-18X-FAL23-SRI	**Water Quality Meter/ ID:**	YSI Pro DSS / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:50	0	120	mL/min	2.75	6.15	0.921	0.2	4.83	11.9	244.2	Clear	No Odor
10:55	5	120	mL/min	2.75	6.1	0.921	0.2	4.59	11.9	244.4	Clear	No Odor
11:00	10	120	mL/min	2.76	6.08	0.921	0.5	4.47	12.3	244.1	Clear	No Odor
11:05	15	120	mL/min	2.76	6.06	0.921	8.7	4.4	12.5	244.3	Clear	No Odor
11:10	20	120	mL/min	2.77	6.06	0.922	4.9	4.35	12.3	244.3	Clear	No Odor
11:15	25	120	mL/min	2.75	6.05	0.922	4.3	4.29	12.6	244.2	Clear	No Odor
11:20	30	120	mL/min	2.75	6.05	0.922	4.8	4.25	12.6	244.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM-99-22X	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	CLEAR, T:41.83 °F, rH:74%, Clouds: 0%, Wind:1.01mph W-NW			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	4.60-14.60	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.28	**Total Depth (ft-bmp):**	14.6	**Water Column(ft):**	10.32	**Liters in Well:**	6.36
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	13	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	07:55	**Total Volume Purged (liters):**	7	**Sample ID:**	ZWM-99-22X-FAL23	**Sample Time:**	09:10
Purge End Time:	09:07	**Well Volumes Purged (total):**	1.1	**Replicate Type / Replicate ID:**	**Duplicate** / AOC69W-DUP01-FAL23	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
08:00	0	100	mL/min	4.28	6.69	3.193	4.25	0.84	10.7	-28.4	Clear	No Odor
08:10	10	100	mL/min	4.3	6.69	2.826	3.67	0.6	11.1	-28.5	Clear	No Odor
08:15	15	100	mL/min	4.31	6.69	2.628	2.7	0.54	11.1	-28.5	Clear	No Odor
08:20	20	100	mL/min	4.32	6.69	2.544	2.34	0.53	11.1	-28.7	Clear	No Odor
08:25	25	100	mL/min	4.32	6.68	2.433	2.1	0.51	11.2	-28.5	Clear	No Odor
08:30	30	100	mL/min	4.33	6.68	2.325	1.74	0.49	11.4	-28.4	Clear	No Odor
08:35	35	100	mL/min	4.33	6.67	2.266	1.33	0.48	11.3	-28.4	Clear	No Odor
08:45	45	100	mL/min	4.33	6.67	2.123	1.18	0.46	12.4	-28.5	Clear	No Odor
08:50	50	100	mL/min	4.33	6.67	2.047	1.18	0.45	12.4	-28.7	Clear	No Odor
08:55	55	100	mL/min	4.34	6.67	1.973	0.8	0.45	12.4	-28.9	Clear	No Odor
09:00	60	100	mL/min	4.34	6.67	1.938	1.09	0.46	12.4	-29	Clear	No Odor
09:05	65	100	mL/min	4.35	6.67	1.93	0.79	0.46	12.4	-29.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? poor

Issues: Flushmount - Bolts Needed,Flushmount - Bolts Need Replacement,Flushmount - Bolt Eyelets Not Useable,Flushmount - Gasket Not Present

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM-99-23X	**Date(s):**	2023-11-16	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	40 F clear			**Field Technician:**		Michael Spaulding	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	4.68-14.68	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.18	**Total Depth (ft-bmp):**	15.18	**Water Column(ft):**	11	**Liters in Well:**	6.8
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	14.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	08:16	**Total Volume Purged (liters):**	10.6	**Sample ID:**	ZWM-99-23X-FAL23	**Sample Time:**	09:10
Purge End Time:	09:10	**Well Volumes Purged (total):**	1.56	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
08:16	0	200	mL/min	4.2	6.37	0.69	59.7	1.56	13.5	59	Brown	No Odor
08:22	6	200	mL/min	4.21	6.21	0.682	24.4	0.45	13.8	43	Clear	No Odor
08:26	10	200	mL/min	4.21	6.2	0.678	18.8	0.29	13.8	34.7	Clear	No Odor
08:30	14	200	mL/min	4.21	6.19	0.673	13.4	0.21	13.8	25.5	Clear	No Odor
08:34	18	200	mL/min	4.21	6.18	0.67	13.3	0.17	13.8	18.2	Clear	No Odor
08:39	23	200	mL/min	4.21	6.18	0.664	12.8	0.13	13.9	11.9	Clear	No Odor
08:43	27	200	mL/min	4.21	6.17	0.658	9.8	0.11	13.9	7.8	Clear	No Odor
08:49	33	200	mL/min	4.21	6.16	0.651	6.95	0.08	13.9	4.4	Clear	No Odor
08:53	37	200	mL/min	4.21	6.15	0.643	7.05	0.06	13.9	2.3	Clear	No Odor
08:57	41	200	mL/min	4.21	6.15	0.64	6.19	0.05	14	1.1	Clear	No Odor
09:01	45	200	mL/min	4.21	6.14	0.633	4.92	0.04	14	-0.1	Clear	No Odor
09:05	49	200	mL/min	4.21	6.14	0.629	4.96	0.03	14	-1.1	Clear	No Odor
09:09	53	200	mL/min	4.21	6.14	0.624	3.89	0.02	14	-2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

Groundwater Sampling Form

Location ID:	ZWM-99-24X	**Date(s):**	2023-11-14	**Work Order(s):**		2023 Fall LTM + SRI Sampling	
Client:	USACE	**Facility:**	Former Fort Devens	**Facility Location:**	Devens, MA	**Area:**	AOC 69W
Weather(°F):	CLOUDS, T:46.44 °F, rH:68%, Clouds: 100%, Wind:12.66mph NW			**Field Technician:**		Allyson Fenton	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	5.52-15.52	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.31	**Total Depth (ft-bmp):**	15	**Water Column(ft):**	10.69	**Liters in Well:**	6.59
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	13.5	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	13:00	**Total Volume Purged (liters):**	7	**Sample ID:**	ZWM-99-24X -FAL23	**Sample Time:**	13:40
Purge End Time:	13:39	**Well Volumes Purged (total):**	1.06	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI Pro DSS / 21f102556
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (µS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:05	0	200	mL/min	4.31	6.23	0.254	1.53	0.67	12.9	-33.2	Clear	No Odor
13:15	10	200	mL/min	4.32	6.21	0.258	0.49	0.62	12.9	-33.1	Clear	No Odor
13:20	15	200	mL/min	4.31	6.2	0.259	0.58	0.57	13	-33.2	Clear	No Odor
13:25	20	200	mL/min	4.31	6.18	0.266	0.47	0.51	12.9	-33.2	Clear	No Odor
13:30	25	200	mL/min	4.31	6.18	0.269	0.74	0.5	12.6	-33.2	Clear	No Odor
13:35	30	200	mL/min	4.31	6.17	0.273	1.17	0.49	12.6	-33.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals (SW6020) - Total	Plastic	1	HNO3
Metals (SW6020) - Dissolved	Plastic	1	HNO3
Metals (SW6010) - Total	Plastic	1	HNO3
Metals (SW6010) - Dissolved	Plastic	1	HNO3
TPH (ARC-MAVPH)	Clear Glass	3	HCL
TPH (ARC-MAEPH)	Amber Glass	2	HCL
Anions (SW9056A)	Plastic	1	none
TOC (SW9060)	Plastic	1	HNO3
GenChem (A2320)	Plastic	1	none
Gases (RSK175)	Clear Glass	1	none
Sulfide (9034)	Plastic	2	ZNAC/NAOH

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U. = Standard Unit

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	06/07/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.08	7.04	yes	07:40
pH	4	4	yes	07:42
pH	9.9	9.9	yes	07:47
Conductivity	1.352	1.415	yes	07:51
ORP	230.5	231	yes	07:57
DO	100.7	98.3	yes	08:03

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

6/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	4740
SAMPLER	Diane Champagne
DATE	06/07/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.34	7.04	yes	08:18
pH	4.07	4.04	yes	08:20
pH	9.83	10.09	yes	08:22
Conductivity	1.024	1.025	yes	08:16
ORP	238.6	233.7	yes	08:24
DO	97.8	97.8	yes	08:11
DO	2.16	0.02	yes	08:28
Turbidity	3.39	0	yes	08:14

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	06/07/2023

SINGLE POINT CALIBRATION

LOT NUMBER	22420139
EXPIRATION DATE	2024-09-07

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.96	4	yes	08:16
pH	7.11	7	yes	08:18
pH	10.08	10	yes	08:23
Conductivity	0.953	1.413	no	08:37
ORP	231.3	240.49	yes	08:28
DO	94.4	99.1	yes	08:40

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	06/08/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.09	7	yes	07:56
pH	3.95	4	yes	07:58
pH	9.9	10	yes	07:59
Conductivity	1.109	1.413	yes	08:06
ORP	233.5	231	yes	08:11
DO	--	--	--	--
Turbidity	0.1	0.1	yes	08:14
Turbidity	20	20	yes	08:15
Turbidity	99.6	99.8	yes	08:17
Turbidity	800	800	yes	08:20

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/8/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	06/08/2023

SINGLE POINT CALIBRATION

LOT NUMBER	M066-02
EXPIRATION DATE	2024-03-08

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.98	4	yes	08:53
pH	7.12	7	yes	08:54
pH	10	10	yes	08:57
Conductivity	1.306	1.413	yes	08:33
ORP	241.7	243.5	yes	08:47
DO	99.6	99.6	yes	08:24

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/8/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	06/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.12	7	yes	07:49
pH	3.97	4	yes	07:51
pH	9.92	10	yes	07:53
Conductivity	1.722	1.413	yes	07:57
ORP	232.1	231	yes	08:01
DO	97.7	99	yes	08:04
Turbidity	0.1	0.02	yes	08:04
Turbidity	20	19.5	yes	08:10
Turbidity	100	101	yes	08:10
Turbidity	800	844	yes	08:11

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/9/2023

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	06/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	22370021
EXPIRATION DATE	2024-09-09

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.93	4	yes	08:05
pH	7.05	7	yes	08:07
pH	9.94	10	yes	08:11
Conductivity	1.41	1.413	yes	08:16
ORP	246	243.5	yes	08:38
DO	99.9	99.8	yes	08:47

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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6/9/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/07/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.92	7	yes	07:50
pH	4.04	4	yes	07:51
pH	9.94	10	yes	07:58
Conductivity	1.573	1.413	yes	08:01
ORP	221.9	231	yes	08:04
DO	97.8	99.2	yes	08:08

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/07/2023

SINGLE POINT CALIBRATION				
LOT NUMBER	N/A			
EXPIRATION DATE	N/A			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7	yes	07:06
pH	4.1	4	yes	07:08
pH	10.08	10	yes	07:13
Conductivity	1.952	1.413	yes	07:18
ORP	228	231	yes	07:21
DO	98.4	100	yes	07:03

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/07/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7.04	yes	07:59
pH	4.28	4.08	yes	08:01
pH	9.89	10.05	yes	08:20
Conductivity	1.335	1.343	yes	08:29
ORP	244.8	246.9	yes	08:22
DO	98.5	1.8	yes	08:32

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/7/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.01	7	yes	07:40
pH	4.11	4	yes	07:42
pH	10.14	10	yes	07:47
Conductivity	1.209	1.413	yes	07:55
ORP	240.1	240.1	yes	08:09
DO	93.9	99.3	yes	08:35
Turbidity	1.12	0	yes	08:17

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/9/2023

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.08	7.04	yes	10:20
pH	4.35	4.14	yes	10:21
pH	9.8	10.01	yes	10:34
Conductivity	1.271	1.303	yes	10:43
ORP	230.1	245.4	yes	10:51
DO	--	--	--	--
Turbidity	0.2	0.01	yes	10:48

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/9/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.94	7	yes	08:00
pH	4.02	4	yes	08:01
pH	9.89	10	yes	08:06
Conductivity	1.501	1.413	yes	08:18
ORP	211.2	231	yes	08:22
DO	99.2	99.9	yes	08:28

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Frank

SIGNED

11/9/2023

DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/09/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.99	7	yes	07:28
pH	4.03	4	yes	07:30
pH	10.03	10	yes	07:35
Conductivity	1.369	1.413	yes	07:38
ORP	236.2	231	yes	07:41
DO	98.3	100.7	yes	07:23

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/9/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/10/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.35	7	yes	07:51
pH	4.18	4	yes	07:55
pH	9.84	10	yes	08:01
Conductivity	1.418	1.413	yes	07:52
ORP	241.9	241	yes	08:59
DO	99.2	99.2	yes	08:05
Turbidity	1.2	0	yes	08:56

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/10/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/10/2023

SINGLE POINT CALIBRATION				
LOT NUMBER	N/A			
EXPIRATION DATE	N/A			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.99	7	yes	07:07
pH	3.98	4	yes	07:10
pH	10	10	yes	07:14
Conductivity	1.363	1.413	no	07:18
ORP	236.6	231	yes	07:23
DO	100.6	99.9	yes	07:04

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/10/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/10/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.13	7.03	yes	07:35
pH	4.22	4.08	--	07:46
pH	9.5	10.02	--	07:54
Conductivity	1.28	1.289	--	08:02
ORP	242.1	241.8	--	07:59
DO	44.5	0	--	08:04
Turbidity	1.2	0.1	--	08:13

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/10/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/10/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7	yes	07:43
pH	4.05	4	yes	07:43
pH	9.71	10	yes	07:51
Conductivity	0.833	1.413	yes	07:58
ORP	239.1	231	yes	08:01
DO	99	100	yes	08:03

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/10/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/13/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.12	7	yes	07:39
pH	4.11	4	yes	07:32
pH	10.31	10.02	yes	07:34
Conductivity	1.393	1.413	yes	07:40
ORP	281.1	240.1	yes	07:25
DO	99.3	99.3	yes	07:27
Turbidity	0.62	0	yes	07:15

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/13/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/13/2023

SINGLE POINT CALIBRATION				
LOT NUMBER	N/A			
EXPIRATION DATE	N/A			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.99	7	yes	07:19
pH	4.05	4	yes	07:24
pH	10	10	yes	07:28
Conductivity	1.407	1.413	yes	07:32
ORP	228.1	231	yes	07:36
DO	101.6	100.2	yes	07:15

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/13/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/13/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7	yes	08:27
pH	4.3	4.06	yes	08:31
pH	9.6	9.98	yes	08:42
Conductivity	1.39	1.387	--	08:47
ORP	229.6	237.6	yes	08:44
DO	58	0.04	--	08:50
Turbidity	0.56	0.02	--	08:48

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

SIGNED

11/13/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/13/2023

SINGLE POINT CALIBRATION				
LOT NUMBER	N/A			
EXPIRATION DATE	N/A			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.01	7	yes	07:49
pH	4	4	yes	07:50
pH	9.84	10	yes	07:53
Conductivity	1.521	1.413	yes	07:58
ORP	232.5	231	yes	08:00
DO	102	101.3	yes	08:02

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

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DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/14/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7	yes	07:47
pH	4.04	4	yes	07:42
pH	9.98	9.99	yes	07:38
Conductivity	1.411	1.413	yes	07:31
ORP	238.1	240	yes	07:48
DO	99.8	99.8	yes	07:20
Turbidity	0.15	0	yes	07:49

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/14/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/14/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.02	6.9	--	07:40
pH	4.36	4.08	--	07:51
pH	9.59	10.06	--	07:52
Conductivity	1.232	1.245	--	08:10
ORP	204.7	244.1	--	08:05
DO	78.4	100	--	08:17
Turbidity	1	1.12	--	08:28
Turbidity	0	0.02	--	08:29

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/14/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/14/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.98	7	yes	07:17
pH	4	4	yes	07:20
pH	10.03	10	yes	07:24
Conductivity	1.406	1.413	yes	07:27
ORP	231.2	231	yes	07:31
DO	100.7	100.8	yes	07:15

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/14/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/14/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.17	7	yes	07:55
pH	3.96	4	yes	08:00
pH	9.87	10	yes	08:05
Conductivity	1.427	1.413	yes	08:07
ORP	230	231	yes	08:10
DO	100.1	100	yes	08:14

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/15/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.02	7	yes	07:22
pH	4.05	4	yes	07:26
pH	9.65	9.93	yes	07:29
Conductivity	1.416	1.414	yes	07:35
ORP	256.5	240.1	yes	07:15
DO	99.1	99.6	yes	07:36
Turbidity	1.02	0	yes	07:34

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

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11/15/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/15/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.13	7	yes	07:48
pH	4	4	yes	07:50
pH	10.47	10	yes	07:56
Conductivity	1.383	1.413	yes	07:57
ORP	221.8	231	yes	08:00
DO	101.3	101	yes	08:06

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/15/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/15/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.02	7	yes	07:28
pH	4.02	4	yes	07:30
pH	9.99	10	yes	07:34
Conductivity	1.458	1.413	no	07:36
ORP	228.6	231	yes	07:41
DO	104.6	101.7	yes	07:26

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

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11/15/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/15/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.03	7.06	--	07:34
pH	4.33	4.18	--	07:39
pH	9.57	9.92	--	07:54
Conductivity	1.531	1.503	--	08:13
ORP	231.2	237.9	--	08:05
DO	67.9	100	--	08:08
Turbidity	0	0.02	--	08:06

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/15/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Frank Martinez
DATE	11/16/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	10	10	--	07:51
pH	6.92	7	yes	07:49
pH	3.95	4	yes	07:49
Conductivity	1.361	1.413	yes	07:56
ORP	229.9	231	yes	08:03
DO	101.5	100	yes	08:09

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/16/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Diane Champagne
DATE	11/16/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.14	7	yes	07:17
pH	4.1	4	yes	07:19
pH	10	10	yes	07:22
Conductivity	1.427	1.413	yes	07:25
ORP	233.2	240	yes	07:54
DO	100	100	yes	07:39
Turbidity	1.85	0	yes	07:38

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/16/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	Former Fort Devens Fall 23
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	21F102556
SAMPLER	Michael Spaulding
DATE	11/16/2023

SINGLE POINT CALIBRATION				
LOT NUMBER	N/A			
EXPIRATION DATE	N/A			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.99	7	yes	07:11
pH	4.03	4	yes	07:15
pH	10	10	yes	07:19
Conductivity	1.437	1.413	no	07:23
ORP	231	231	yes	07:26
DO	99.8	100.9	yes	07:08

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

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11/16/2023
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	NE Devens TO LTM RAO SJV
PROJECT NUMBER	30167457
MODEL	YSI ProDSS
SERIAL NUMBER	N/A
SAMPLER	Allyson Fenton
DATE	11/16/2023

SINGLE POINT CALIBRATION

LOT NUMBER	N/A
EXPIRATION DATE	N/A

PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.07	7.03	--	07:47
pH	9.59	9.89	--	08:10
pH	4.55	4.19	--	08:06
Conductivity	1.605	1.45	--	08:22
ORP	233.2	241.1	--	08:20
DO	75.7	100	--	07:52
Turbidity	0.03	0	--	07:50

[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

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11/16/2023
DATE

Appendix B

Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 7/20/2023 7:56:24 PM

JOB DESCRIPTION

Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

JOB NUMBER

680-236086-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-236086-5	32M-01-17XBR-SPR23	Water	06/07/23 14:05	06/09/23 09:46
680-236086-6	32M-RB-01-SPR23	Water	06/07/23 15:00	06/09/23 09:46

Job ID: 680-236086-2

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-236086-2

Receipt
The samples were received on 6/9/2023 9:46 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 5.2°C

Receipt Exceptions
One or more containers for the following samples were received broken or leaking: G6M-04-02X-SPR23 (680-236086-1), G6M-13-02X-SPR23 (680-236086-2), G6M-13-05X-SPR23 (680-236086-3), AOC50-RB-01-SPR23 (680-236086-4), 32M-01-17XBR-SPR23 (680-236086-5), 32M-01-17XBR-SPR23 (680-236086-5[MS]), 32M-01-17XBR-SPR23 (680-236086-5[MSD]), 32M-RB-01-SPR23 (680-236086-6) and AOC50-TB-02-SPR23 (680-236086-7).

one vial received broken for sample -5 parent .

GC/MS VOA
Method 8260D_DOD5: The laboratory control sample duplicate (LCSD) was biased high for 4-Bromofluorobenzene surrogate by 5%. All other QC and sample recoveries were acceptable and within control limits, and sample target analyte recoveries were acceptable. There is insufficient time to rerun samples in hold time, data has been qualified and reported. (LCSD 680-784770/4)

Method 8260D_DOD5: The continuing calibration verification (CCV) associated with batch 680-785162 recovered outside acceptance criteria, low biased, for Carbon tetrachloride. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

Method 8260D_DOD5: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to failure of surrogate in the initial analysis. 32M-01-17XBR-SPR23 (680-236086-5) and 32M-RB-01-SPR23 (680-236086-6)

Method 8260D_DOD5: The closing continuing calibration verification (CCVC) associated with batch 680-785162 recovered above the upper control limit for Chloroethane and Trichlorofluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8260D_DOD5: The closing continuing calibration verification (CCVC) associated with batch 680-785162 recovered outside acceptance criteria, low biased, for Vinyl acetate. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

Method 8260D_DOD5: The initial calibration verification (ICV) analyzed in batch 680-784451 was outside method criteria for the following analyte(s): Trichlorofluoromethane. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Hydrocarbons
Method MAVPH: The method requirement for no headspace was not met. The following volatile samples were analyzed with headspace in the sample container(s): 32M-01-17XBR-SPR23 (680-236086-5), 32M-01-17XBR-SPR23 (680-236086-5[MS]), 32M-01-17XBR-SPR23 (680-236086-5[MSD]) and 32M-RB-01-SPR23 (680-236086-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Client Sample ID: 32M-01-17XBR-SPR23
Lab Sample ID: 680-236086-5
Date Collected: 06/07/23 14:05
Matrix: Water
Date Received: 06/09/23 09:46

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U H	25	10	3.7	ug/L		06/23/23 15:17	1
Benzene	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 15:17	1
Bromobenzene	0.50	U H	1.0	0.50	0.24	ug/L		06/23/23 15:17	1
Chlorobromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 15:17	1
Dichlorobromomethane	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 15:17	1
Bromoform	2.0	U H	2.5	2.0	0.59	ug/L		06/23/23 15:17	1
Bromomethane	10	U H	20	10	3.7	ug/L		06/23/23 15:17	1
2-Butanone (MEK)	20	U H	25	20	6.4	ug/L		06/23/23 15:17	1
n-Butylbenzene	2.0	U H	2.5	2.0	0.52	ug/L		06/23/23 15:17	1
sec-Butylbenzene	2.0	U M H	2.5	2.0	0.53	ug/L		06/23/23 15:17	1
tert-Butylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 15:17	1
Carbon disulfide	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 15:17	1
Carbon tetrachloride	1.0	U H Q	2.0	1.0	0.30	ug/L		06/23/23 15:17	1
Chlorobenzene	0.50	U H	1.0	0.50	0.15	ug/L		06/23/23 15:17	1
Chloroethane	10	U H Q	20	10	4.6	ug/L		06/23/23 15:17	1
Chloroform	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 15:17	1
Chloromethane	2.0	U H	2.5	2.0	0.54	ug/L		06/23/23 15:17	1
2-Chlorotoluene	0.50	U H	1.0	0.50	0.25	ug/L		06/23/23 15:17	1
4-Chlorotoluene	1.0	U H	2.0	1.0	0.41	ug/L		06/23/23 15:17	1
Chlorodibromomethane	1.0	U H	2.0	1.0	0.39	ug/L		06/23/23 15:17	1
1,2-Dibromo-3-Chloropropane	5.0	U H	10	5.0	1.8	ug/L		06/23/23 15:17	1
Ethylene Dibromide	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 15:17	1
Dibromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 15:17	1
1,2-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 15:17	1
1,3-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 15:17	1
1,4-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 15:17	1
Dichlorodifluoromethane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 15:17	1
1,1-Dichloroethane	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 15:17	1
1,2-Dichloroethane	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 15:17	1
cis-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 15:17	1
trans-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 15:17	1
1,2-Dichloroethene, Total	1.0	U H	2.0	1.0	0.37	ug/L		06/23/23 15:17	1
1,1-Dichloroethene	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 15:17	1
1,2-Dichloropropane	0.50	U H	1.0	0.50	0.22	ug/L		06/23/23 15:17	1
1,3-Dichloropropane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 15:17	1
2,2-Dichloropropane	1.0	U H	2.0	1.0	0.35	ug/L		06/23/23 15:17	1
1,1-Dichloropropene	1.0	U H	2.0	1.0	0.28	ug/L		06/23/23 15:17	1
cis-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 15:17	1
trans-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.23	ug/L		06/23/23 15:17	1
Ethylbenzene	0.50	U H	1.0	0.50	0.20	ug/L		06/23/23 15:17	1
Hexachlorobutadiene	1.0	U H	5.0	1.0	0.22	ug/L		06/23/23 15:17	1
2-Hexanone	10	U H	20	10	3.2	ug/L		06/23/23 15:17	1
Isopropylbenzene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 15:17	1
4-Isopropyltoluene	1.0	U H	2.0	1.0	0.44	ug/L		06/23/23 15:17	1
Methylene Chloride	10	U H	20	10	3.2	ug/L		06/23/23 15:17	1
4-Methyl-2-pentanone (MIBK)	10	U H	20	10	2.7	ug/L		06/23/23 15:17	1
Methyl tert-butyl ether	2.0	U H	5.0	2.0	0.81	ug/L		06/23/23 15:17	1
Naphthalene	5.0	U H	10	5.0	2.4	ug/L		06/23/23 15:17	1
N-Propylbenzene	1.0	U H	2.0	1.0	0.41	ug/L		06/23/23 15:17	1

Client Sample ID: 32M-01-17XBR-SPR23
Lab Sample ID: 680-236086-5
Date Collected: 06/07/23 14:05
Matrix: Water
Date Received: 06/09/23 09:46

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - RA (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 15:17	1
1,1,1,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 15:17	1
1,1,2,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.40	ug/L		06/23/23 15:17	1
Tetrachloroethene	1.0	U H	2.0	1.0	0.35	ug/L		06/23/23 15:17	1
Toluene	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 15:17	1
1,2,3-Trichlorobenzene	2.0	U H	5.0	2.0	0.81	ug/L		06/23/23 15:17	1
1,2,4-Trichlorobenzene	2.0	U H	5.0	2.0	0.53	ug/L		06/23/23 15:17	1
1,1,1-Trichloroethane	0.50	U H	1.0	0.50	0.21	ug/L		06/23/23 15:17	1
1,1,2-Trichloroethane	1.0	U H	2.0	1.0	0.32	ug/L		06/23/23 15:17	1
Trichloroethene	0.50	U H	1.0	0.50	0.20	ug/L		06/23/23 15:17	1
Trichlorofluoromethane	1.0	U H Q	2.0	1.0	0.33	ug/L		06/23/23 15:17	1
1,2,3-Trichloropropane	1.0	U H	2.0	1.0	0.48	ug/L		06/23/23 15:17	1
1,2,4-Trimethylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 15:17	1
1,3,5-Trimethylbenzene	1.0	U H	2.0	1.0	0.28	ug/L		06/23/23 15:17	1
Vinyl acetate	2.0	U H Q	2.5	2.0	0.69	ug/L		06/23/23 15:17	1
Vinyl chloride	1.0	U H	2.0	1.0	0.40	ug/L		06/23/23 15:17	1
o-Xylene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 15:17	1
m-Xylene & p-Xylene	1.0	U H	2.0	1.0	0.49	ug/L		06/23/23 15:17	1
Xylenes, Total	1.0	U H	2.0	1.0	0.49	ug/L		06/23/23 15:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*89 - 112*		*06/23/23 15:17*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*81 - 118*		*06/23/23 15:17*	*1*
4-Bromofluorobenzene (Surr)	*97*		*85 - 114*		*06/23/23 15:17*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 119*		*06/23/23 15:17*	*1*

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U J1	5.0	2.0	1.0	ug/L		06/21/23 01:48	1
C9-C10 Aromatics	20	U J1	100	20	10	ug/L		06/21/23 01:48	1
Ethylbenzene	2.0	U J1	5.0	2.0	1.0	ug/L		06/21/23 01:48	1
Methyl tert-butyl ether	2.0	U J1	5.0	2.0	1.0	ug/L		06/21/23 01:48	1
Naphthalene	4.0	U J1	6.0	4.0	2.0	ug/L		06/21/23 01:48	1
Toluene	2.0	U J1	5.0	2.0	1.0	ug/L		06/21/23 01:48	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 01:48	1
m-Xylene & p-Xylene	5.0	U J1	10	5.0	2.5	ug/L		06/21/23 01:48	1
o-Xylene	2.0	U J1	5.0	2.0	1.0	ug/L		06/21/23 01:48	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 01:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 01:48*	*1*
a,a,a-Trifluorotoluene (pid)	*99*		*70 - 130*		*06/21/23 01:48*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	**5.9**	**J**	10	5.0	1.3	ug/L		06/14/23 15:55	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**0.94**	**J**	5.0	3.0	0.86	ug/L		06/14/23 15:18	1

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Client Sample ID: 32M-RB-01-SPR23
Lab Sample ID: 680-236086-6
Date Collected: 06/07/23 15:00
Matrix: Water
Date Received: 06/09/23 09:46

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U H	25	10	3.7	ug/L		06/23/23 14:34	1
Benzene	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 14:34	1
Bromobenzene	0.50	U H	1.0	0.50	0.24	ug/L		06/23/23 14:34	1
Chlorobromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 14:34	1
Dichlorobromomethane	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 14:34	1
Bromoform	2.0	U H	2.5	2.0	0.59	ug/L		06/23/23 14:34	1
Bromomethane	10	U H	20	10	3.7	ug/L		06/23/23 14:34	1
2-Butanone (MEK)	20	U H	25	20	6.4	ug/L		06/23/23 14:34	1
n-Butylbenzene	2.0	U H	2.5	2.0	0.52	ug/L		06/23/23 14:34	1
sec-Butylbenzene	2.0	U H	2.5	2.0	0.53	ug/L		06/23/23 14:34	1
tert-Butylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 14:34	1
Carbon disulfide	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 14:34	1
Carbon tetrachloride	1.0	U H Q	2.0	1.0	0.30	ug/L		06/23/23 14:34	1
Chlorobenzene	0.50	U H	1.0	0.50	0.15	ug/L		06/23/23 14:34	1
Chloroethane	10	U H Q	20	10	4.6	ug/L		06/23/23 14:34	1
Chloroform	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 14:34	1
Chloromethane	2.0	U H	2.5	2.0	0.54	ug/L		06/23/23 14:34	1
2-Chlorotoluene	0.50	U H	1.0	0.50	0.25	ug/L		06/23/23 14:34	1
4-Chlorotoluene	1.0	U H	2.0	1.0	0.41	ug/L		06/23/23 14:34	1
Chlorodibromomethane	1.0	U H	2.0	1.0	0.39	ug/L		06/23/23 14:34	1
1,2-Dibromo-3-Chloropropane	5.0	U H	10	5.0	1.8	ug/L		06/23/23 14:34	1
Ethylene Dibromide	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 14:34	1
Dibromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 14:34	1
1,2-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 14:34	1
1,3-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 14:34	1
1,4-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/23/23 14:34	1
Dichlorodifluoromethane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 14:34	1
1,1-Dichloroethane	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 14:34	1
1,2-Dichloroethane	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 14:34	1
cis-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 14:34	1
trans-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.34	ug/L		06/23/23 14:34	1
1,2-Dichloroethene, Total	1.0	U H	2.0	1.0	0.37	ug/L		06/23/23 14:34	1
1,1-Dichloroethene	1.0	U H	2.0	1.0	0.33	ug/L		06/23/23 14:34	1
1,2-Dichloropropane	0.50	U H	1.0	0.50	0.22	ug/L		06/23/23 14:34	1
1,3-Dichloropropane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 14:34	1
2,2-Dichloropropane	1.0	U H	2.0	1.0	0.35	ug/L		06/23/23 14:34	1
1,1-Dichloropropene	1.0	U H	2.0	1.0	0.28	ug/L		06/23/23 14:34	1
cis-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 14:34	1
trans-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.23	ug/L		06/23/23 14:34	1
Ethylbenzene	0.50	U H	1.0	0.50	0.20	ug/L		06/23/23 14:34	1
Hexachlorobutadiene	1.0	U H	5.0	1.0	0.22	ug/L		06/23/23 14:34	1
2-Hexanone	10	U M H	20	10	3.2	ug/L		06/23/23 14:34	1
Isopropylbenzene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 14:34	1
4-Isopropyltoluene	1.0	U H	2.0	1.0	0.44	ug/L		06/23/23 14:34	1
Methylene Chloride	10	U H	20	10	3.2	ug/L		06/23/23 14:34	1
4-Methyl-2-pentanone (MIBK)	10	U H	20	10	2.7	ug/L		06/23/23 14:34	1
Methyl tert-butyl ether	2.0	U H	5.0	2.0	0.81	ug/L		06/23/23 14:34	1
Naphthalene	5.0	U H	10	5.0	2.4	ug/L		06/23/23 14:34	1
N-Propylbenzene	1.0	U H	2.0	1.0	0.41	ug/L		06/23/23 14:34	1

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Client Sample ID: 32M-RB-01-SPR23
Lab Sample ID: 680-236086-6
Date Collected: 06/07/23 15:00
Matrix: Water
Date Received: 06/09/23 09:46

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - RA (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U H	2.0	1.0	0.27	ug/L		06/23/23 14:34	1
1,1,1,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.36	ug/L		06/23/23 14:34	1
1,1,2,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.40	ug/L		06/23/23 14:34	1
Tetrachloroethene	1.0	U H	2.0	1.0	0.35	ug/L		06/23/23 14:34	1
Toluene	1.0	U H	2.0	1.0	0.25	ug/L		06/23/23 14:34	1
1,2,3-Trichlorobenzene	2.0	U H	5.0	2.0	0.81	ug/L		06/23/23 14:34	1
1,2,4-Trichlorobenzene	2.0	U H	5.0	2.0	0.53	ug/L		06/23/23 14:34	1
1,1,1-Trichloroethane	0.50	U H	1.0	0.50	0.21	ug/L		06/23/23 14:34	1
1,1,2-Trichloroethane	1.0	U H	2.0	1.0	0.32	ug/L		06/23/23 14:34	1
Trichloroethene	0.50	U H	1.0	0.50	0.20	ug/L		06/23/23 14:34	1
Trichlorofluoromethane	1.0	U H Q	2.0	1.0	0.33	ug/L		06/23/23 14:34	1
1,2,3-Trichloropropane	1.0	U H	2.0	1.0	0.48	ug/L		06/23/23 14:34	1
1,2,4-Trimethylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/23/23 14:34	1
1,3,5-Trimethylbenzene	1.0	U H	2.0	1.0	0.28	ug/L		06/23/23 14:34	1
Vinyl acetate	2.0	U H Q	2.5	2.0	0.69	ug/L		06/23/23 14:34	1
Vinyl chloride	1.0	U H	2.0	1.0	0.40	ug/L		06/23/23 14:34	1
o-Xylene	1.0	U H	2.0	1.0	0.26	ug/L		06/23/23 14:34	1
m-Xylene & p-Xylene	1.0	U H	2.0	1.0	0.49	ug/L		06/23/23 14:34	1
Xylenes, Total	1.0	U H	2.0	1.0	0.49	ug/L		06/23/23 14:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*89 - 112*		*06/23/23 14:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*81 - 118*		*06/23/23 14:34*	*1*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*06/23/23 14:34*	*1*
Dibromofluoromethane (Surr)	*91*		*80 - 119*		*06/23/23 14:34*	*1*

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 05:54	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 05:54	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 05:54	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 05:54	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 05:54	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 05:54	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 05:54	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 05:54	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 05:54	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 05:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 05:54*	*1*
a,a,a-Trifluorotoluene (pid)	*100*		*70 - 130*		*06/21/23 05:54*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	5.0	U	10	5.0	1.3	ug/L		06/13/23 17:21	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 14:58	1

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-784770/9
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/21/23 15:59	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/21/23 15:59	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/21/23 15:59	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/21/23 15:59	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/21/23 15:59	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		06/21/23 15:59	1
Bromomethane	10	U	20	10	3.7	ug/L		06/21/23 15:59	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/21/23 15:59	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/21/23 15:59	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/21/23 15:59	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/21/23 15:59	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/21/23 15:59	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/21/23 15:59	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/21/23 15:59	1
Chloroethane	10	U	20	10	4.6	ug/L		06/21/23 15:59	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/21/23 15:59	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/21/23 15:59	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/21/23 15:59	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/21/23 15:59	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/21/23 15:59	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/21/23 15:59	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/21/23 15:59	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/21/23 15:59	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/21/23 15:59	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/21/23 15:59	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/21/23 15:59	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/21/23 15:59	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/21/23 15:59	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/21/23 15:59	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/21/23 15:59	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/21/23 15:59	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/21/23 15:59	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/21/23 15:59	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/21/23 15:59	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/21/23 15:59	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/21/23 15:59	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/21/23 15:59	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/21/23 15:59	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/21/23 15:59	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/21/23 15:59	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/21/23 15:59	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/21/23 15:59	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/21/23 15:59	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/21/23 15:59	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/21/23 15:59	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/21/23 15:59	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/21/23 15:59	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/21/23 15:59	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-784770/9
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/21/23 15:59	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/21/23 15:59	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/21/23 15:59	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/21/23 15:59	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/21/23 15:59	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/21/23 15:59	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/21/23 15:59	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/21/23 15:59	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/21/23 15:59	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/21/23 15:59	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/21/23 15:59	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/21/23 15:59	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/21/23 15:59	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/21/23 15:59	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/21/23 15:59	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		06/21/23 15:59	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/21/23 15:59	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/21/23 15:59	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/21/23 15:59	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/21/23 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*89 - 112*		*06/21/23 15:59*	*1*
1,2-Dichloroethane-d4 (Surr)	*111*		*81 - 118*		*06/21/23 15:59*	*1*
4-Bromofluorobenzene (Surr)	*85*		*85 - 114*		*06/21/23 15:59*	*1*
Dibromofluoromethane (Surr)	*110*		*80 - 119*		*06/21/23 15:59*	*1*

Lab Sample ID: LCS 680-784770/3
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	247		ug/L		99	39 - 160
Benzene	50.0	52.1		ug/L		104	79 - 120
Bromobenzene	50.0	51.2		ug/L		102	80 - 120
Chlorobromomethane	50.0	52.9		ug/L		106	78 - 123
Dichlorobromomethane	50.0	60.0		ug/L		120	79 - 125
Bromoform	50.0	51.2		ug/L		102	66 - 130
Bromomethane	50.0	54.6		ug/L		109	53 - 141
2-Butanone (MEK)	250	259		ug/L		104	56 - 143
n-Butylbenzene	50.0	54.7		ug/L		109	75 - 128
sec-Butylbenzene	50.0	50.7		ug/L		101	77 - 126
tert-Butylbenzene	50.0	50.6		ug/L		101	78 - 124
Carbon disulfide	50.0	51.9		ug/L		104	64 - 133
Carbon tetrachloride	50.0	51.8		ug/L		104	72 - 136
Chlorobenzene	50.0	52.1		ug/L		104	82 - 118
Chloroethane	50.0	53.2		ug/L		106	60 - 138
Chloroform	50.0	54.6		ug/L		109	79 - 124

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-784770/3
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloromethane	50.0	50.9		ug/L		102	50 - 139
2-Chlorotoluene	50.0	55.9		ug/L		112	79 - 122
4-Chlorotoluene	50.0	55.3		ug/L		111	78 - 122
Chlorodibromomethane	50.0	58.0		ug/L		116	74 - 126
1,2-Dibromo-3-Chloropropane	50.0	54.7		ug/L		109	62 - 128
Ethylene Dibromide	50.0	55.2		ug/L		110	75 - 127
Dibromomethane	50.0	58.3		ug/L		117	79 - 123
1,2-Dichlorobenzene	50.0	55.4		ug/L		111	80 - 119
1,3-Dichlorobenzene	50.0	54.1		ug/L		108	80 - 119
1,4-Dichlorobenzene	50.0	56.9		ug/L		114	79 - 118
Dichlorodifluoromethane	50.0	48.1		ug/L		96	32 - 152
1,1-Dichloroethane	50.0	53.1		ug/L		106	77 - 125
1,2-Dichloroethane	50.0	55.9		ug/L		112	73 - 128
cis-1,2-Dichloroethene	50.0	55.9		ug/L		112	78 - 123
trans-1,2-Dichloroethene	50.0	53.5		ug/L		107	75 - 124
1,2-Dichloroethene, Total	100	109		ug/L		109	79 - 121
1,1-Dichloroethene	50.0	55.6		ug/L		111	71 - 131
1,2-Dichloropropane	50.0	56.7		ug/L		113	78 - 122
1,3-Dichloropropane	50.0	57.2		ug/L		114	80 - 119
2,2-Dichloropropane	50.0	51.6		ug/L		103	60 - 139
1,1-Dichloropropene	50.0	51.8		ug/L		104	79 - 125
cis-1,3-Dichloropropene	50.0	55.2		ug/L		110	75 - 124
trans-1,3-Dichloropropene	50.0	57.7		ug/L		115	73 - 127
Ethylbenzene	50.0	54.3		ug/L		109	79 - 121
Hexachlorobutadiene	50.0	58.7		ug/L		117	66 - 134
2-Hexanone	250	234		ug/L		93	57 - 139
Isopropylbenzene	50.0	52.5		ug/L		105	72 - 131
4-Isopropyltoluene	50.0	53.3		ug/L		107	77 - 127
Methylene Chloride	50.0	55.2		ug/L		110	74 - 124
4-Methyl-2-pentanone (MIBK)	250	269		ug/L		108	67 - 130
Methyl tert-butyl ether	50.0	53.8		ug/L		108	71 - 124
Naphthalene	50.0	56.9		ug/L		114	61 - 128
N-Propylbenzene	50.0	55.0		ug/L		110	76 - 126
Styrene	50.0	53.4		ug/L		107	78 - 123
1,1,1,2-Tetrachloroethane	50.0	54.1		ug/L		108	78 - 124
1,1,2,2-Tetrachloroethane	50.0	49.8		ug/L		100	71 - 121
Tetrachloroethene	50.0	53.1		ug/L		106	74 - 129
Toluene	50.0	54.6		ug/L		109	80 - 121
1,2,3-Trichlorobenzene	50.0	61.9		ug/L		124	69 - 129
1,2,4-Trichlorobenzene	50.0	59.5		ug/L		119	69 - 130
1,1,1-Trichloroethane	50.0	53.8		ug/L		108	74 - 131
1,1,2-Trichloroethane	50.0	56.3		ug/L		113	80 - 119
Trichloroethene	50.0	55.2		ug/L		110	79 - 123
Trichlorofluoromethane	50.0	77.1	Q	ug/L		154	65 - 141
1,2,3-Trichloropropane	50.0	51.2		ug/L		102	73 - 122
1,2,4-Trimethylbenzene	50.0	50.5		ug/L		101	76 - 124
1,3,5-Trimethylbenzene	50.0	52.1		ug/L		104	75 - 124
Vinyl acetate	100	92.4		ug/L		92	54 - 146
Vinyl chloride	50.0	52.9		ug/L		106	58 - 137

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-784770/3
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
o-Xylene			50.0	53.7		ug/L		107	78 - 122		
m-Xylene & p-Xylene			50.0	55.3		ug/L		111	80 - 121		
Xylenes, Total			100	109		ug/L		109	79 - 121		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*93*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*114*		*81 - 118*
4-Bromofluorobenzene (Surr)	*114*		*85 - 114*
Dibromofluoromethane (Surr)	*113*		*80 - 119*

Lab Sample ID: LCSD 680-784770/4
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone			250	245		ug/L		98	39 - 160	1	20
Benzene			50.0	52.5		ug/L		105	79 - 120	1	20
Bromobenzene			50.0	48.1		ug/L		96	80 - 120	6	20
Chlorobromomethane			50.0	52.9		ug/L		106	78 - 123	0	20
Dichlorobromomethane			50.0	60.6		ug/L		121	79 - 125	1	20
Bromoform			50.0	50.8		ug/L		102	66 - 130	1	20
Bromomethane			50.0	53.0		ug/L		106	53 - 141	3	20
2-Butanone (MEK)			250	259		ug/L		103	56 - 143	0	20
n-Butylbenzene			50.0	62.4		ug/L		125	75 - 128	13	20
sec-Butylbenzene			50.0	40.6	Q	ug/L		81	77 - 126	22	20
tert-Butylbenzene			50.0	39.3	Q	ug/L		79	78 - 124	25	20
Carbon disulfide			50.0	52.9		ug/L		106	64 - 133	2	20
Carbon tetrachloride			50.0	52.6		ug/L		105	72 - 136	2	20
Chlorobenzene			50.0	54.0		ug/L		108	82 - 118	4	20
Chloroethane			50.0	54.0		ug/L		108	60 - 138	1	20
Chloroform			50.0	54.3		ug/L		109	79 - 124	1	20
Chloromethane			50.0	49.5		ug/L		99	50 - 139	3	20
2-Chlorotoluene			50.0	43.9	Q	ug/L		88	79 - 122	24	20
4-Chlorotoluene			50.0	44.3	Q	ug/L		89	78 - 122	22	20
Chlorodibromomethane			50.0	57.8		ug/L		116	74 - 126	0	20
1,2-Dibromo-3-Chloropropane			50.0	53.9		ug/L		108	62 - 128	2	20
Ethylene Dibromide			50.0	54.8		ug/L		110	75 - 127	1	20
Dibromomethane			50.0	57.7		ug/L		115	79 - 123	1	20
1,2-Dichlorobenzene			50.0	56.7		ug/L		113	80 - 119	2	20
1,3-Dichlorobenzene			50.0	52.1		ug/L		104	80 - 119	4	20
1,4-Dichlorobenzene			50.0	55.3		ug/L		111	79 - 118	3	20
Dichlorodifluoromethane			50.0	50.4		ug/L		101	32 - 152	5	20
1,1-Dichloroethane			50.0	53.8		ug/L		108	77 - 125	1	20
1,2-Dichloroethane			50.0	56.0		ug/L		112	73 - 128	0	20
cis-1,2-Dichloroethene			50.0	56.9		ug/L		114	78 - 123	2	20
trans-1,2-Dichloroethene			50.0	54.2		ug/L		108	75 - 124	1	20
1,2-Dichloroethene, Total			100	111		ug/L		111	79 - 121	1	20
1,1-Dichloroethene			50.0	55.9		ug/L		112	71 - 131	1	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-784770/4
Matrix: Water
Analysis Batch: 784770

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2-Dichloropropane	50.0	57.3		ug/L		115	78 - 122	1	20
1,3-Dichloropropane	50.0	57.7		ug/L		115	80 - 119	1	20
2,2-Dichloropropane	50.0	51.7		ug/L		103	60 - 139	0	20
1,1-Dichloropropene	50.0	53.0		ug/L		106	79 - 125	2	20
cis-1,3-Dichloropropene	50.0	54.9		ug/L		110	75 - 124	1	20
trans-1,3-Dichloropropene	50.0	57.9		ug/L		116	73 - 127	0	20
Ethylbenzene	50.0	54.2		ug/L		108	79 - 121	0	20
Hexachlorobutadiene	50.0	63.5		ug/L		127	66 - 134	8	20
2-Hexanone	250	222		ug/L		89	57 - 139	5	20
Isopropylbenzene	50.0	38.5	Q	ug/L		77	72 - 131	31	20
4-Isopropyltoluene	50.0	58.4		ug/L		117	77 - 127	9	20
Methylene Chloride	50.0	55.7		ug/L		111	74 - 124	1	20
4-Methyl-2-pentanone (MIBK)	250	267		ug/L		107	67 - 130	1	20
Methyl tert-butyl ether	50.0	53.5		ug/L		107	71 - 124	1	20
Naphthalene	50.0	73.5	Q	ug/L		147	61 - 128	25	20
N-Propylbenzene	50.0	42.3	Q	ug/L		85	76 - 126	26	20
Styrene	50.0	42.7	Q	ug/L		85	78 - 123	22	20
1,1,1,2-Tetrachloroethane	50.0	54.7		ug/L		109	78 - 124	1	20
1,1,2,2-Tetrachloroethane	50.0	58.7		ug/L		117	71 - 121	16	20
Tetrachloroethene	50.0	53.5		ug/L		107	74 - 129	1	20
Toluene	50.0	56.9		ug/L		114	80 - 121	4	20
1,2,3-Trichlorobenzene	50.0	77.0	Q	ug/L		154	69 - 129	22	20
1,2,4-Trichlorobenzene	50.0	76.8	Q	ug/L		154	69 - 130	25	20
1,1,1-Trichloroethane	50.0	55.0		ug/L		110	74 - 131	2	20
1,1,2-Trichloroethane	50.0	56.4		ug/L		113	80 - 119	0	20
Trichloroethene	50.0	57.3		ug/L		115	79 - 123	4	20
Trichlorofluoromethane	50.0	78.2	Q	ug/L		156	65 - 141	1	20
1,2,3-Trichloropropane	50.0	50.2		ug/L		100	73 - 122	2	20
1,2,4-Trimethylbenzene	50.0	49.3		ug/L		99	76 - 124	2	20
1,3,5-Trimethylbenzene	50.0	50.6		ug/L		101	75 - 124	3	20
Vinyl acetate	100	79.1		ug/L		79	54 - 146	15	20
Vinyl chloride	50.0	53.0		ug/L		106	58 - 137	0	20
o-Xylene	50.0	44.2		ug/L		88	78 - 122	19	20
m-Xylene & p-Xylene	50.0	45.5		ug/L		91	80 - 121	20	20
Xylenes, Total	100	89.7		ug/L		90	79 - 121	19	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*95*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*115*		*81 - 118*
4-Bromofluorobenzene (Surr)	*119*	*Q*	*85 - 114*
Dibromofluoromethane (Surr)	*115*		*80 - 119*

Lab Sample ID: 680-236086-5 MS
Matrix: Water
Analysis Batch: 784770

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	10	U	250	242		ug/L		97	39 - 160

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-236086-5 MS
Client Sample ID: 32M-01-17XBR-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784770

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	1.0	U	50.0	53.9		ug/L		108	79 - 120
Bromobenzene	0.50	U	50.0	55.4		ug/L		111	80 - 120
Chlorobromomethane	1.0	U	50.0	54.9		ug/L		110	78 - 123
Dichlorobromomethane	1.0	U	50.0	60.8		ug/L		122	79 - 125
Bromoform	2.0	U	50.0	47.1		ug/L		94	66 - 130
Bromomethane	10	U	50.0	52.6		ug/L		105	53 - 141
2-Butanone (MEK)	20	U	250	266		ug/L		106	56 - 143
n-Butylbenzene	2.0	U	50.0	49.2		ug/L		98	75 - 128
sec-Butylbenzene	2.0	U Q	50.0	45.9		ug/L		92	77 - 126
tert-Butylbenzene	1.0	U Q	50.0	45.9		ug/L		92	78 - 124
Carbon disulfide	1.0	U	50.0	55.8		ug/L		112	64 - 133
Carbon tetrachloride	1.0	U	50.0	57.1		ug/L		114	72 - 136
Chlorobenzene	0.50	U	50.0	52.6		ug/L		105	82 - 118
Chloroethane	10	U Q J1	50.0	103	J1	ug/L		205	60 - 138
Chloroform	1.0	U	50.0	56.8		ug/L		114	79 - 124
Chloromethane	2.0	U	50.0	41.4		ug/L		83	50 - 139
2-Chlorotoluene	0.50	U Q	50.0	58.0		ug/L		116	79 - 122
4-Chlorotoluene	1.0	U Q	50.0	54.5		ug/L		109	78 - 122
Chlorodibromomethane	1.0	U	50.0	56.7		ug/L		113	74 - 126
1,2-Dibromo-3-Chloropropane	5.0	U	50.0	47.1		ug/L		94	62 - 128
Ethylene Dibromide	1.0	U	50.0	53.6		ug/L		107	75 - 127
Dibromomethane	1.0	U	50.0	57.4		ug/L		115	79 - 123
1,2-Dichlorobenzene	1.0	U	50.0	52.1		ug/L		104	80 - 119
1,3-Dichlorobenzene	1.0	U	50.0	51.4		ug/L		103	80 - 119
1,4-Dichlorobenzene	1.0	U	50.0	53.2		ug/L		106	79 - 118
Dichlorodifluoromethane	1.0	U	50.0	44.5		ug/L		89	32 - 152
1,1-Dichloroethane	1.0	U	50.0	56.2		ug/L		112	77 - 125
1,2-Dichloroethane	1.0	U M	50.0	57.8		ug/L		116	73 - 128
cis-1,2-Dichloroethene	1.0	U	50.0	57.5		ug/L		115	78 - 123
trans-1,2-Dichloroethene	1.0	U	50.0	57.3		ug/L		115	75 - 124
1,2-Dichloroethene, Total	1.0	U	100	115		ug/L		115	79 - 121
1,1-Dichloroethene	1.0	U	50.0	59.6		ug/L		119	71 - 131
1,2-Dichloropropane	0.50	U	50.0	56.4		ug/L		113	78 - 122
1,3-Dichloropropane	1.0	U	50.0	57.7		ug/L		115	80 - 119
2,2-Dichloropropane	1.0	U	50.0	42.8		ug/L		86	60 - 139
1,1-Dichloropropene	1.0	U	50.0	56.4		ug/L		113	79 - 125
cis-1,3-Dichloropropene	1.0	U	50.0	54.8		ug/L		110	75 - 124
trans-1,3-Dichloropropene	1.0	U	50.0	53.8		ug/L		108	73 - 127
Ethylbenzene	0.50	U Q J1	50.0	63.4	J1	ug/L		127	79 - 121
Hexachlorobutadiene	1.0	U	50.0	43.7		ug/L		87	66 - 134
2-Hexanone	10	U	250	269		ug/L		107	57 - 139
Isopropylbenzene	1.0	U Q	50.0	55.7		ug/L		111	72 - 131
4-Isopropyltoluene	1.0	U	50.0	48.7		ug/L		97	77 - 127
Methylene Chloride	10	U	50.0	57.2		ug/L		114	74 - 124
4-Methyl-2-pentanone (MIBK)	10	U	250	292		ug/L		117	67 - 130
Methyl tert-butyl ether	2.0	U	50.0	55.5		ug/L		111	71 - 124
Naphthalene	5.0	U Q	50.0	47.9		ug/L		96	61 - 128
N-Propylbenzene	1.0	U Q	50.0	51.5		ug/L		103	76 - 126
Styrene	1.0	U Q	50.0	53.5		ug/L		107	78 - 123

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-236086-5 MS
Client Sample ID: 32M-01-17XBR-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784770

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	1.0	U	50.0	49.1		ug/L		98	78 - 124
1,1,2,2-Tetrachloroethane	1.0	U Q	50.0	50.6		ug/L		101	71 - 121
Tetrachloroethene	1.0	U	50.0	51.7		ug/L		103	74 - 129
Toluene	1.0	U	50.0	60.4		ug/L		121	80 - 121
1,2,3-Trichlorobenzene	2.0	U Q	50.0	53.5		ug/L		107	69 - 129
1,2,4-Trichlorobenzene	2.0	U Q	50.0	45.3		ug/L		91	69 - 130
1,1,1-Trichloroethane	0.50	U	50.0	58.2		ug/L		116	74 - 131
1,1,2-Trichloroethane	1.0	U	50.0	55.0		ug/L		110	80 - 119
Trichloroethene	0.50	U	50.0	55.6		ug/L		111	79 - 123
Trichlorofluoromethane	1.0	U Q J1	50.0	83.8	J1	ug/L		168	65 - 141
1,2,3-Trichloropropane	1.0	U	50.0	49.3		ug/L		99	73 - 122
1,2,4-Trimethylbenzene	1.0	U	50.0	45.8		ug/L		92	76 - 124
1,3,5-Trimethylbenzene	1.0	U	50.0	46.3		ug/L		93	75 - 124
Vinyl acetate	2.0	U Q	100	106		ug/L		106	54 - 146
Vinyl chloride	1.0	U	50.0	48.0		ug/L		96	58 - 137
o-Xylene	1.0	U Q J1	50.0	58.6		ug/L		117	78 - 122
m-Xylene & p-Xylene	1.0	U Q J1	50.0	60.2		ug/L		120	80 - 121
Xylenes, Total	1.0	U Q J1	100	119		ug/L		119	79 - 121

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*93*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*115*		*81 - 118*
4-Bromofluorobenzene (Surr)	*124*	*Q*	*85 - 114*
Dibromofluoromethane (Surr)	*115*		*80 - 119*

Lab Sample ID: 680-236086-5 MSD
Client Sample ID: 32M-01-17XBR-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784770

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	10	U	250	249		ug/L		100	39 - 160	3	20
Benzene	1.0	U	50.0	53.8		ug/L		108	79 - 120	0	20
Bromobenzene	0.50	U	50.0	56.3		ug/L		113	80 - 120	2	20
Chlorobromomethane	1.0	U	50.0	56.0		ug/L		112	78 - 123	2	20
Dichlorobromomethane	1.0	U	50.0	61.6		ug/L		123	79 - 125	1	20
Bromoform	2.0	U	50.0	48.4		ug/L		97	66 - 130	3	20
Bromomethane	10	U	50.0	50.6		ug/L		101	53 - 141	4	20
2-Butanone (MEK)	20	U	250	271		ug/L		109	56 - 143	2	20
n-Butylbenzene	2.0	U	50.0	48.7		ug/L		97	75 - 128	1	20
sec-Butylbenzene	2.0	U Q	50.0	44.9		ug/L		90	77 - 126	2	20
tert-Butylbenzene	1.0	U Q	50.0	47.6		ug/L		95	78 - 124	4	20
Carbon disulfide	1.0	U	50.0	55.6		ug/L		111	64 - 133	0	20
Carbon tetrachloride	1.0	U	50.0	56.0		ug/L		112	72 - 136	2	20
Chlorobenzene	0.50	U	50.0	53.1		ug/L		106	82 - 118	1	20
Chloroethane	10	U Q J1	50.0	101	J1	ug/L		202	60 - 138	1	20
Chloroform	1.0	U	50.0	57.1		ug/L		114	79 - 124	1	20
Chloromethane	2.0	U	50.0	41.4		ug/L		83	50 - 139	0	20
2-Chlorotoluene	0.50	U Q	50.0	59.6		ug/L		119	79 - 122	3	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-236086-5 MSD
Client Sample ID: 32M-01-17XBR-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784770

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4-Chlorotoluene	1.0	U Q	50.0	56.7		ug/L		113	78 - 122	4	20
Chlorodibromomethane	1.0	U	50.0	57.0		ug/L		114	74 - 126	1	20
1,2-Dibromo-3-Chloropropane	5.0	U	50.0	50.7		ug/L		101	62 - 128	7	20
Ethylene Dibromide	1.0	U	50.0	55.6		ug/L		111	75 - 127	4	20
Dibromomethane	1.0	U	50.0	58.5		ug/L		117	79 - 123	2	20
1,2-Dichlorobenzene	1.0	U	50.0	54.1		ug/L		108	80 - 119	4	20
1,3-Dichlorobenzene	1.0	U	50.0	54.1		ug/L		108	80 - 119	5	20
1,4-Dichlorobenzene	1.0	U	50.0	53.8		ug/L		108	79 - 118	1	20
Dichlorodifluoromethane	1.0	U	50.0	44.0		ug/L		88	32 - 152	1	20
1,1-Dichloroethane	1.0	U	50.0	56.1		ug/L		112	77 - 125	0	20
1,2-Dichloroethane	1.0	U M	50.0	59.1		ug/L		118	73 - 128	2	20
cis-1,2-Dichloroethene	1.0	U	50.0	57.4		ug/L		115	78 - 123	0	20
trans-1,2-Dichloroethene	1.0	U	50.0	56.5		ug/L		113	75 - 124	1	20
1,2-Dichloroethene, Total	1.0	U	100	114		ug/L		114	79 - 121	1	20
1,1-Dichloroethene	1.0	U	50.0	58.2		ug/L		116	71 - 131	2	20
1,2-Dichloropropane	0.50	U	50.0	57.1		ug/L		114	78 - 122	1	20
1,3-Dichloropropane	1.0	U	50.0	57.9		ug/L		116	80 - 119	0	20
2,2-Dichloropropane	1.0	U	50.0	42.0		ug/L		84	60 - 139	2	20
1,1-Dichloropropene	1.0	U	50.0	54.9		ug/L		110	79 - 125	3	20
cis-1,3-Dichloropropene	1.0	U	50.0	55.8		ug/L		112	75 - 124	2	20
trans-1,3-Dichloropropene	1.0	U	50.0	53.2		ug/L		106	73 - 127	1	20
Ethylbenzene	0.50	U Q J1	50.0	62.7	J1	ug/L		125	79 - 121	1	20
Hexachlorobutadiene	1.0	U	50.0	42.3		ug/L		85	66 - 134	3	20
2-Hexanone	10	U	250	264		ug/L		106	57 - 139	2	20
Isopropylbenzene	1.0	U Q	50.0	59.8		ug/L		120	72 - 131	7	20
4-Isopropyltoluene	1.0	U	50.0	47.5		ug/L		95	77 - 127	2	20
Methylene Chloride	10	U	50.0	58.7		ug/L		117	74 - 124	3	20
4-Methyl-2-pentanone (MIBK)	10	U	250	292		ug/L		117	67 - 130	0	20
Methyl tert-butyl ether	2.0	U	50.0	56.4		ug/L		113	71 - 124	2	20
Naphthalene	5.0	U Q	50.0	52.0		ug/L		104	61 - 128	8	20
N-Propylbenzene	1.0	U Q	50.0	53.5		ug/L		107	76 - 126	4	20
Styrene	1.0	U Q	50.0	58.6		ug/L		117	78 - 123	9	20
1,1,1,2-Tetrachloroethane	1.0	U	50.0	49.1		ug/L		98	78 - 124	0	20
1,1,2,2-Tetrachloroethane	1.0	U Q	50.0	50.9		ug/L		102	71 - 121	1	20
Tetrachloroethene	1.0	U	50.0	52.2		ug/L		104	74 - 129	1	20
Toluene	1.0	U	50.0	56.4		ug/L		113	80 - 121	7	20
1,2,3-Trichlorobenzene	2.0	U Q	50.0	53.8		ug/L		108	69 - 129	1	20
1,2,4-Trichlorobenzene	2.0	U Q	50.0	46.0		ug/L		92	69 - 130	1	20
1,1,1-Trichloroethane	0.50	U	50.0	57.3		ug/L		115	74 - 131	2	20
1,1,2-Trichloroethane	1.0	U	50.0	55.2		ug/L		110	80 - 119	0	20
Trichloroethene	0.50	U	50.0	55.9		ug/L		112	79 - 123	1	20
Trichlorofluoromethane	1.0	U Q J1	50.0	83.3	J1	ug/L		167	65 - 141	1	20
1,2,3-Trichloropropane	1.0	U	50.0	49.9		ug/L		100	73 - 122	1	20
1,2,4-Trimethylbenzene	1.0	U	50.0	45.7		ug/L		91	76 - 124	0	20
1,3,5-Trimethylbenzene	1.0	U	50.0	46.3		ug/L		93	75 - 124	0	20
Vinyl acetate	2.0	U Q	100	107		ug/L		107	54 - 146	1	20
Vinyl chloride	1.0	U	50.0	47.5		ug/L		95	58 - 137	1	20
o-Xylene	1.0	U Q J1	50.0	61.6	J1	ug/L		123	78 - 122	5	20
m-Xylene & p-Xylene	1.0	U Q J1	50.0	62.2	J1	ug/L		124	80 - 121	3	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-236086-5 MSD
Client Sample ID: 32M-01-17XBR-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784770

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Xylenes, Total	1.0	U Q J1	100	124	J1	ug/L		124	79 - 121	4	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*90*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*120*	*Q*	*81 - 118*
4-Bromofluorobenzene (Surr)	*128*	*Q*	*85 - 114*
Dibromofluoromethane (Surr)	*117*		*80 - 119*

Lab Sample ID: MB 680-785162/8
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 785162

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 12:56	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 12:56	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 12:56	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 12:56	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 12:56	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		06/23/23 12:56	1
Bromomethane	10	U	20	10	3.7	ug/L		06/23/23 12:56	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 12:56	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 12:56	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 12:56	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 12:56	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 12:56	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 12:56	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 12:56	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 12:56	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 12:56	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 12:56	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 12:56	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 12:56	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 12:56	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 12:56	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 12:56	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 12:56	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 12:56	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 12:56	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 12:56	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 12:56	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 12:56	1
1,2-Dichloroethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 12:56	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 12:56	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 12:56	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 12:56	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 12:56	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 12:56	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 12:56	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-785162/8
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 12:56	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 12:56	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 12:56	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 12:56	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 12:56	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 12:56	1
2-Hexanone	10	U M	20	10	3.2	ug/L		06/23/23 12:56	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 12:56	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 12:56	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 12:56	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 12:56	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 12:56	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 12:56	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 12:56	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 12:56	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 12:56	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 12:56	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 12:56	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 12:56	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 12:56	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 12:56	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 12:56	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 12:56	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 12:56	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 12:56	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 12:56	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 12:56	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 12:56	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		06/23/23 12:56	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 12:56	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 12:56	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 12:56	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 12:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*89 - 112*		*06/23/23 12:56*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*81 - 118*		*06/23/23 12:56*	*1*
4-Bromofluorobenzene (Surr)	*102*		*85 - 114*		*06/23/23 12:56*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 119*		*06/23/23 12:56*	*1*

Lab Sample ID: LCS 680-785162/4
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	251		ug/L		100	39 - 160
Benzene	50.0	51.9		ug/L		104	79 - 120
Bromobenzene	50.0	54.8		ug/L		110	80 - 120

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-785162/4
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chlorobromomethane	50.0	56.3		ug/L		113	78 - 123
Dichlorobromomethane	50.0	47.3		ug/L		95	79 - 125
Bromoform	50.0	44.3		ug/L		89	66 - 130
Bromomethane	50.0	47.0		ug/L		94	53 - 141
2-Butanone (MEK)	250	257		ug/L		103	56 - 143
n-Butylbenzene	50.0	56.6		ug/L		113	75 - 128
sec-Butylbenzene	50.0	54.2		ug/L		108	77 - 126
tert-Butylbenzene	50.0	53.6		ug/L		107	78 - 124
Carbon disulfide	50.0	48.2		ug/L		96	64 - 133
Carbon tetrachloride	50.0	39.4		ug/L		79	72 - 136
Chlorobenzene	50.0	50.3		ug/L		101	82 - 118
Chloroethane	50.0	38.4		ug/L		77	60 - 138
Chloroform	50.0	48.4		ug/L		97	79 - 124
Chloromethane	50.0	48.8		ug/L		98	50 - 139
2-Chlorotoluene	50.0	50.5	M	ug/L		101	79 - 122
4-Chlorotoluene	50.0	52.4		ug/L		105	78 - 122
Chlorodibromomethane	50.0	45.6		ug/L		91	74 - 126
1,2-Dibromo-3-Chloropropane	50.0	48.8		ug/L		98	62 - 128
Ethylene Dibromide	50.0	48.7		ug/L		97	75 - 127
Dibromomethane	50.0	48.7		ug/L		97	79 - 123
1,2-Dichlorobenzene	50.0	54.0		ug/L		108	80 - 119
1,3-Dichlorobenzene	50.0	53.6		ug/L		107	80 - 119
1,4-Dichlorobenzene	50.0	51.2		ug/L		102	79 - 118
Dichlorodifluoromethane	50.0	51.0		ug/L		102	32 - 152
1,1-Dichloroethane	50.0	50.2		ug/L		100	77 - 125
1,2-Dichloroethane	50.0	46.6		ug/L		93	73 - 128
cis-1,2-Dichloroethene	50.0	48.7		ug/L		97	78 - 123
trans-1,2-Dichloroethene	50.0	47.5		ug/L		95	75 - 124
1,2-Dichloroethene, Total	100	96.2		ug/L		96	79 - 121
1,1-Dichloroethene	50.0	50.7		ug/L		101	71 - 131
1,2-Dichloropropane	50.0	54.4		ug/L		109	78 - 122
1,3-Dichloropropane	50.0	48.9		ug/L		98	80 - 119
2,2-Dichloropropane	50.0	44.5		ug/L		89	60 - 139
1,1-Dichloropropene	50.0	50.6		ug/L		101	79 - 125
cis-1,3-Dichloropropene	50.0	51.3		ug/L		103	75 - 124
trans-1,3-Dichloropropene	50.0	50.1		ug/L		100	73 - 127
Ethylbenzene	50.0	53.4		ug/L		107	79 - 121
Hexachlorobutadiene	50.0	52.2		ug/L		104	66 - 134
2-Hexanone	250	265		ug/L		106	57 - 139
Isopropylbenzene	50.0	52.6		ug/L		105	72 - 131
4-Isopropyltoluene	50.0	55.0		ug/L		110	77 - 127
Methylene Chloride	50.0	50.5		ug/L		101	74 - 124
4-Methyl-2-pentanone (MIBK)	250	264		ug/L		106	67 - 130
Methyl tert-butyl ether	50.0	50.6	M	ug/L		101	71 - 124
Naphthalene	50.0	48.8		ug/L		98	61 - 128
N-Propylbenzene	50.0	53.9		ug/L		108	76 - 126
Styrene	50.0	55.9		ug/L		112	78 - 123
1,1,1,2-Tetrachloroethane	50.0	48.4		ug/L		97	78 - 124
1,1,2,2-Tetrachloroethane	50.0	54.1		ug/L		108	71 - 121

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-785162/4
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Tetrachloroethene			50.0	46.7		ug/L		93	74 - 129		
Toluene			50.0	54.1		ug/L		108	80 - 121		
1,2,3-Trichlorobenzene			50.0	55.0		ug/L		110	69 - 129		
1,2,4-Trichlorobenzene			50.0	52.3		ug/L		105	69 - 130		
1,1,1-Trichloroethane			50.0	45.2		ug/L		90	74 - 131		
1,1,2-Trichloroethane			50.0	50.5		ug/L		101	80 - 119		
Trichloroethene			50.0	47.8		ug/L		96	79 - 123		
Trichlorofluoromethane			50.0	41.9		ug/L		84	65 - 141		
1,2,3-Trichloropropane			50.0	49.4		ug/L		99	73 - 122		
1,2,4-Trimethylbenzene			50.0	52.4		ug/L		105	76 - 124		
1,3,5-Trimethylbenzene			50.0	52.8		ug/L		106	75 - 124		
Vinyl acetate			100	101		ug/L		101	54 - 146		
Vinyl chloride			50.0	51.7		ug/L		103	58 - 137		
o-Xylene			50.0	53.5		ug/L		107	78 - 122		
m-Xylene & p-Xylene			50.0	51.4		ug/L		103	80 - 121		
Xylenes, Total			100	105		ug/L		105	79 - 121		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*85*		*81 - 118*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*
Dibromofluoromethane (Surr)	*95*		*80 - 119*

Lab Sample ID: LCSD 680-785162/5
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone			250	262		ug/L		105	39 - 160	5	20
Benzene			50.0	50.7		ug/L		101	79 - 120	2	20
Bromobenzene			50.0	54.8		ug/L		110	80 - 120	0	20
Chlorobromomethane			50.0	47.9		ug/L		96	78 - 123	16	20
Dichlorobromomethane			50.0	49.7		ug/L		99	79 - 125	5	20
Bromoform			50.0	48.0		ug/L		96	66 - 130	8	20
Bromomethane			50.0	50.8		ug/L		102	53 - 141	8	20
2-Butanone (MEK)			250	275		ug/L		110	56 - 143	7	20
n-Butylbenzene			50.0	54.5		ug/L		109	75 - 128	4	20
sec-Butylbenzene			50.0	58.5		ug/L		117	77 - 126	8	20
tert-Butylbenzene			50.0	54.8		ug/L		110	78 - 124	2	20
Carbon disulfide			50.0	45.5		ug/L		91	64 - 133	6	20
Carbon tetrachloride			50.0	40.2		ug/L		80	72 - 136	2	20
Chlorobenzene			50.0	50.0		ug/L		100	82 - 118	1	20
Chloroethane			50.0	41.4		ug/L		83	60 - 138	8	20
Chloroform			50.0	49.0		ug/L		98	79 - 124	1	20
Chloromethane			50.0	51.4		ug/L		103	50 - 139	5	20
2-Chlorotoluene			50.0	51.3	M	ug/L		103	79 - 122	2	20
4-Chlorotoluene			50.0	52.4	M	ug/L		105	78 - 122	0	20
Chlorodibromomethane			50.0	48.2		ug/L		96	74 - 126	6	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-785162/5
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2-Dibromo-3-Chloropropane	50.0	52.0		ug/L		104	62 - 128	6	20
Ethylene Dibromide	50.0	51.8		ug/L		104	75 - 127	6	20
Dibromomethane	50.0	49.3		ug/L		99	79 - 123	1	20
1,2-Dichlorobenzene	50.0	53.5		ug/L		107	80 - 119	1	20
1,3-Dichlorobenzene	50.0	53.6		ug/L		107	80 - 119	0	20
1,4-Dichlorobenzene	50.0	50.5		ug/L		101	79 - 118	1	20
Dichlorodifluoromethane	50.0	52.7		ug/L		105	32 - 152	3	20
1,1-Dichloroethane	50.0	48.5		ug/L		97	77 - 125	3	20
1,2-Dichloroethane	50.0	49.2		ug/L		98	73 - 128	5	20
cis-1,2-Dichloroethene	50.0	49.6		ug/L		99	78 - 123	2	20
trans-1,2-Dichloroethene	50.0	46.1		ug/L		92	75 - 124	3	20
1,2-Dichloroethene, Total	100	95.7		ug/L		96	79 - 121	1	20
1,1-Dichloroethene	50.0	49.8		ug/L		100	71 - 131	2	20
1,2-Dichloropropane	50.0	52.5		ug/L		105	78 - 122	4	20
1,3-Dichloropropane	50.0	50.5		ug/L		101	80 - 119	3	20
2,2-Dichloropropane	50.0	44.3		ug/L		89	60 - 139	0	20
1,1-Dichloropropene	50.0	50.5		ug/L		101	79 - 125	0	20
cis-1,3-Dichloropropene	50.0	50.7		ug/L		101	75 - 124	1	20
trans-1,3-Dichloropropene	50.0	51.3		ug/L		103	73 - 127	2	20
Ethylbenzene	50.0	52.1		ug/L		104	79 - 121	3	20
Hexachlorobutadiene	50.0	50.1		ug/L		100	66 - 134	4	20
2-Hexanone	250	287		ug/L		115	57 - 139	8	20
Isopropylbenzene	50.0	52.6		ug/L		105	72 - 131	0	20
4-Isopropyltoluene	50.0	53.1		ug/L		106	77 - 127	4	20
Methylene Chloride	50.0	48.8		ug/L		98	74 - 124	3	20
4-Methyl-2-pentanone (MIBK)	250	278		ug/L		111	67 - 130	5	20
Methyl tert-butyl ether	50.0	53.1	M	ug/L		106	71 - 124	5	20
Naphthalene	50.0	49.7		ug/L		99	61 - 128	2	20
N-Propylbenzene	50.0	52.5		ug/L		105	76 - 126	3	20
Styrene	50.0	55.9		ug/L		112	78 - 123	0	20
1,1,1,2-Tetrachloroethane	50.0	49.7		ug/L		99	78 - 124	3	20
1,1,2,2-Tetrachloroethane	50.0	55.4		ug/L		111	71 - 121	2	20
Tetrachloroethene	50.0	48.1		ug/L		96	74 - 129	3	20
Toluene	50.0	53.8		ug/L		108	80 - 121	1	20
1,2,3-Trichlorobenzene	50.0	56.4		ug/L		113	69 - 129	2	20
1,2,4-Trichlorobenzene	50.0	51.8		ug/L		104	69 - 130	1	20
1,1,1-Trichloroethane	50.0	46.1		ug/L		92	74 - 131	2	20
1,1,2-Trichloroethane	50.0	52.4		ug/L		105	80 - 119	4	20
Trichloroethene	50.0	47.7		ug/L		95	79 - 123	0	20
Trichlorofluoromethane	50.0	44.1		ug/L		88	65 - 141	5	20
1,2,3-Trichloropropane	50.0	52.2		ug/L		104	73 - 122	5	20
1,2,4-Trimethylbenzene	50.0	56.6		ug/L		113	76 - 124	8	20
1,3,5-Trimethylbenzene	50.0	52.8		ug/L		106	75 - 124	0	20
Vinyl acetate	100	102		ug/L		102	54 - 146	1	20
Vinyl chloride	50.0	54.4		ug/L		109	58 - 137	5	20
o-Xylene	50.0	53.0		ug/L		106	78 - 122	1	20
m-Xylene & p-Xylene	50.0	51.1		ug/L		102	80 - 121	1	20
Xylenes, Total	100	104		ug/L		104	79 - 121	1	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-785162/5
Matrix: Water
Analysis Batch: 785162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	*102*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*91*		*81 - 118*
4-Bromofluorobenzene (Surr)	*94*		*85 - 114*
Dibromofluoromethane (Surr)	*97*		*80 - 119*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-388890/2
Matrix: Water
Analysis Batch: 388890

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/20/23 21:42	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/20/23 21:42	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/20/23 21:42	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/20/23 21:42	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/20/23 21:42	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/20/23 21:42	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/20/23 21:42	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/20/23 21:42	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/20/23 21:42	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/20/23 21:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/20/23 21:42*	*1*
a,a,a-Trifluorotoluene (pid)	*98*		*70 - 130*		*06/20/23 21:42*	*1*

Lab Sample ID: LCS 410-388890/3
Matrix: Water
Analysis Batch: 388890

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	50.1	47.4		ug/L		95	70 - 130
C9-C10 Aromatics	50.2	49.0	J	ug/L		98	70 - 130
Ethylbenzene	50.1	48.4		ug/L		97	70 - 130
Methyl tert-butyl ether	50.2	47.8		ug/L		95	70 - 130
Naphthalene	50.2	52.0		ug/L		104	70 - 130
Toluene	50.1	47.6		ug/L		95	70 - 130
m-Xylene & p-Xylene	101	98.6		ug/L		98	70 - 130
o-Xylene	50.4	48.7		ug/L		97	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*102*		*70 - 130*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 410-388890/4
Matrix: Water
Analysis Batch: 388890

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene			50.1	47.1		ug/L		94	70 - 130	1	25
C9-C10 Aromatics			50.2	48.6	J	ug/L		97	70 - 130	1	25
Ethylbenzene			50.1	47.9		ug/L		96	70 - 130	1	25
Methyl tert-butyl ether			50.2	47.6		ug/L		95	70 - 130	0	25
Naphthalene			50.2	52.7		ug/L		105	70 - 130	1	25
Toluene			50.1	47.1		ug/L		94	70 - 130	1	25
m-Xylene & p-Xylene			101	97.7		ug/L		97	70 - 130	1	25
o-Xylene			50.4	48.3		ug/L		96	70 - 130	1	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*102*		*70 - 130*

Lab Sample ID: 680-236086-5 MS
Matrix: Water
Analysis Batch: 388890

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	2.0	U J1	50.1	23.1	J1	ug/L		46	70 - 130
C9-C10 Aromatics	20	U J1	50.2	31.1	J J1	ug/L		62	70 - 130
Ethylbenzene	2.0	U J1	50.1	23.2	J1	ug/L		46	70 - 130
Methyl tert-butyl ether	2.0	U J1	50.2	20.7	J1	ug/L		41	70 - 130
Naphthalene	4.0	U J1	50.2	22.8	J1	ug/L		45	70 - 130
Toluene	2.0	U J1	50.1	23.0	J1	ug/L		46	70 - 130
m-Xylene & p-Xylene	5.0	U J1	101	47.1	J1	ug/L		47	70 - 130
o-Xylene	2.0	U J1	50.4	23.2	J1	ug/L		46	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*103*		*70 - 130*

Lab Sample ID: 680-236086-5 MSD
Matrix: Water
Analysis Batch: 388890

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	2.0	U J1	50.1	26.2	J1	ug/L		52	70 - 130	13	25
C9-C10 Aromatics	20	U J1	50.2	34.9	J	ug/L		70	70 - 130	11	25
Ethylbenzene	2.0	U J1	50.1	26.5	J1	ug/L		53	70 - 130	13	25
Methyl tert-butyl ether	2.0	U J1	50.2	24.1	J1	ug/L		48	70 - 130	15	25
Naphthalene	4.0	U J1	50.2	25.6	J1	ug/L		51	70 - 130	12	25
Toluene	2.0	U J1	50.1	26.1	J1	ug/L		52	70 - 130	13	25
m-Xylene & p-Xylene	5.0	U J1	101	53.6	J1	ug/L		53	70 - 130	13	25
o-Xylene	2.0	U J1	50.4	26.4	J1	ug/L		52	70 - 130	13	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-236086-5 MSD
Matrix: Water
Analysis Batch: 388890

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
a,a,a-Trifluorotoluene (pid)	*103*		*70 - 130*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-783305/1-A
Matrix: Water
Analysis Batch: 783464

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783305

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	5.0	U	10	5.0	1.3	ug/L		06/13/23 17:00	1

Lab Sample ID: LCS 680-783305/2-A
Matrix: Water
Analysis Batch: 783464

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783305

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	400	416		ug/L		104	90 - 114

Lab Sample ID: MB 680-783316/1-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783316

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 15:51	1

Lab Sample ID: LCS 680-783316/2-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	400	431		ug/L		108	90 - 114

Lab Sample ID: 680-236086-5 MS
Matrix: Water
Analysis Batch: 783688

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total Recoverable
Prep Batch: 783316

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	5.9	J	400	443		ug/L		109	90 - 114

Lab Sample ID: 680-236086-5 MSD
Matrix: Water
Analysis Batch: 783688

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total Recoverable
Prep Batch: 783316

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	5.9	J	400	435		ug/L		107	90 - 114	2	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-783301/1-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783301

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 13:41	1

Lab Sample ID: LCS 680-783301/2-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	106		ug/L		106	84 - 116

Lab Sample ID: MB 680-783315/1-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783315

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 15:10	1

Lab Sample ID: LCS 680-783315/2-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783315

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	105		ug/L		105	84 - 116

Lab Sample ID: 680-236086-5 MS
Matrix: Water
Analysis Batch: 783691

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total Recoverable
Prep Batch: 783315

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.94	J	100	110		ug/L		109	84 - 116

Lab Sample ID: 680-236086-5 MSD
Matrix: Water
Analysis Batch: 783691

Client Sample ID: 32M-01-17XBR-SPR23
Prep Type: Total Recoverable
Prep Batch: 783315

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	0.94	J	100	109		ug/L		108	84 - 116	1	20

GC/MS VOA

Analysis Batch: 784770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-784770/9	Method Blank	Total/NA	Water	8260D	
LCS 680-784770/3	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-784770/4	Lab Control Sample Dup	Total/NA	Water	8260D	
680-236086-5 MS	32M-01-17XBR-SPR23	Total/NA	Water	8260D	
680-236086-5 MSD	32M-01-17XBR-SPR23	Total/NA	Water	8260D	

Analysis Batch: 785162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5 - RA	32M-01-17XBR-SPR23	Total/NA	Water	8260D	
680-236086-6 - RA	32M-RB-01-SPR23	Total/NA	Water	8260D	
MB 680-785162/8	Method Blank	Total/NA	Water	8260D	
LCS 680-785162/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-785162/5	Lab Control Sample Dup	Total/NA	Water	8260D	

GC VOA

Analysis Batch: 388890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5	32M-01-17XBR-SPR23	Total/NA	Water	MAVPH	
680-236086-6	32M-RB-01-SPR23	Total/NA	Water	MAVPH	
MB 410-388890/2	Method Blank	Total/NA	Water	MAVPH	
LCS 410-388890/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 410-388890/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	
680-236086-5 MS	32M-01-17XBR-SPR23	Total/NA	Water	MAVPH	
680-236086-5 MSD	32M-01-17XBR-SPR23	Total/NA	Water	MAVPH	

Metals

Prep Batch: 783301

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-6	32M-RB-01-SPR23	Total Recoverable	Water	3005A	
MB 680-783301/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783301/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-6	32M-RB-01-SPR23	Total Recoverable	Water	3005A	
MB 680-783305/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783305/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	
MB 680-783315/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783315/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236086-5 MS	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	
680-236086-5 MSD	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	

Prep Batch: 783316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	
MB 680-783316/1-A	Method Blank	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 783316 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-783316/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236086-5 MS	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	
680-236086-5 MSD	32M-01-17XBR-SPR23	Total Recoverable	Water	3005A	

Analysis Batch: 783464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-6	32M-RB-01-SPR23	Total Recoverable	Water	6010C	783305
MB 680-783305/1-A	Method Blank	Total Recoverable	Water	6010C	783305
LCS 680-783305/2-A	Lab Control Sample	Total Recoverable	Water	6010C	783305

Analysis Batch: 783688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5	32M-01-17XBR-SPR23	Total Recoverable	Water	6010C	783316
MB 680-783316/1-A	Method Blank	Total Recoverable	Water	6010C	783316
LCS 680-783316/2-A	Lab Control Sample	Total Recoverable	Water	6010C	783316
680-236086-5 MS	32M-01-17XBR-SPR23	Total Recoverable	Water	6010C	783316
680-236086-5 MSD	32M-01-17XBR-SPR23	Total Recoverable	Water	6010C	783316

Analysis Batch: 783691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236086-5	32M-01-17XBR-SPR23	Total Recoverable	Water	6020A	783315
680-236086-6	32M-RB-01-SPR23	Total Recoverable	Water	6020A	783301
MB 680-783301/1-A	Method Blank	Total Recoverable	Water	6020A	783301
MB 680-783315/1-A	Method Blank	Total Recoverable	Water	6020A	783315
LCS 680-783301/2-A	Lab Control Sample	Total Recoverable	Water	6020A	783301
LCS 680-783315/2-A	Lab Control Sample	Total Recoverable	Water	6020A	783315
680-236086-5 MS	32M-01-17XBR-SPR23	Total Recoverable	Water	6020A	783315
680-236086-5 MSD	32M-01-17XBR-SPR23	Total Recoverable	Water	6020A	783315

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Client Sample ID: 32M-01-17XBR-SPR23
Lab Sample ID: 680-236086-5

Date Collected: 06/07/23 14:05
Matrix: Water
Date Received: 06/09/23 09:46

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D	RA	1	5 mL	5 mL	785162	06/23/23 15:17	Y1S	EET SAV
	Instrument ID: CMSAJ									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	388890	06/21/23 01:48	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783316	06/13/23 10:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 15:55	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783315	06/13/23 10:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 15:18	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 32M-RB-01-SPR23
Lab Sample ID: 680-236086-6

Date Collected: 06/07/23 15:00
Matrix: Water
Date Received: 06/09/23 09:46

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D	RA	1	5 mL	5 mL	785162	06/23/23 14:34	Y1S	EET SAV
	Instrument ID: CMSAJ									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	388890	06/21/23 05:54	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783305	06/13/23 10:01	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783464	06/13/23 17:21	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783301	06/13/23 10:01	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 14:58	BWR	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	07-09-23

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236086-2
Project/Site: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds (GC/MS)	SW846	EET SAV
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	ELLE
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
5030C	Purge and Trap	SW846	EET SAV
5030C	Purge and Trap	SW846	ELLE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer singer@arcadis com

COC # AOC32_43A_SP

US Army Corps of Engineers ®

Project Name Former Fort Devens, Long Term Monitoring	Laboratory Eurofins Environment Testing TestAmerica, Savannah, GA	Event Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Project Number DEVNS-LTM	POC Jerry Lanier, 912-250-0281, jerry lanier@eurofinsus com	
WBS Code	Ship to Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments
MADEPVP (A) = VPH with targets

Equipment

Code	Matrix
WG	Ground Water

Code	Container/Preservative
4	3x 40mL glass VOA Vials, HCl pH < 2 Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2, Cool < 6degC
29	3x 40mL glass VOA Vials HCl, pH < 2, Cool < 6degC

Boston #215

Event. Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023

	Sample ID	Matrix	Date	Time	Samp Init	MADEPVP (A)	SW6010C - Mn	SW6020A - As	SW8260B - VOCs	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
	Analytical Test Method					4	9	9	29						
1	32M-01-13XBR-SPR23	WG				X	X	X	X	32M-01-13XBR	N1	13 70	23 70		
2	32M-01-14XOB-SPR23	WG				X	X	X	X	32M-01-14XOB	N1	17 30	27 30		
4	32M-01-17XBR-SPR23	WG	6/7/23	14 05	DC	X	X	X	X	32M-01-17XBR	N1	41 40	51 40		
3	32M-01-17XBR-SPR23	WG	6/7/23	14.05	DC	X	X	X	X	32M-01-17XBR	MS1	41 40	51 40		
5	32M-01-17XBR-SPR23	WG	6/7/23	14 05	DC	X	X	X	X	32M-01-17XBR	SD1	41 40	51 40		
6	32M-01-18XBR-SPR23	WG				X	X	X	X	32M-01-18XBR	N1	14 00	24 00		
7	32M-DUP01-SPR23	WG				X	X	X	X	32M-01-18XBR	FD1	14 00	24 00		
8	32M-RB 01-SPR23	WG	6/7/23	15:00	DC	X	X	X	X						
9															
10															
11															
12															

Turnaround Time Standard

Relinquished by (Signature) Grace Shuler
Date 6/7/2023
Time 17:20
Received by (Signature)

6/8/23 1700

Received by Laboratory (Signature)
Date
Time

TA 6.9.23 946

7/20/2023

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-740778.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry Lanier@et eurofinsus com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): Dept. of Defense ELAP - A2LA, DoD - ANAB		Job #: 680-236086-1
Address: 2425 New Holland Pike,	Due Date Requested: 6/20/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #			
Email:	WO #			
Project Name: Seres-Arcadis JV,LTM, AOC 32/43A, Spring 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	MAVPH/5030C (MOD) MA VPH	MAVPH_Calc	PRE_SCREEN	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
32M-01-17XBR-SPR23 (680-236086-5)	6/7/23	14:05 Eastern		Water			X	X	X	2	
32M-01-17XBR-SPR23 (680-236086-5MS)	6/7/23	14:05 Eastern	MS	Water			X			3	
32M-01-17XBR-SPR23 (680-236086-5MSD)	6/7/23	14:05 Eastern	MSD	Water			X			3	
32M-RB-01-SPR23 (680-236086-6)	6/7/23	15:00 Eastern		Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
		6/12/23 1600				
	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	Relinquished by	Date/Time	Company	Received by	Date/Time 6/13/23 1005	Company FEDEX

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: Raw 1.9- COC 1.7

MB

Ver: 06/08/2021

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-740983.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): Dept. of Defense ELAP - A2LA, DoD - ANAB		Job #: 680-236086-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 6/20/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV,LTM, AOC 50, Spring 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9034/ Sulfide	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
G6M-04-02X-SPR23 (680-236086-1)	6/7/23	11:25 Eastern		Water			X	2	
G6M-13-02X-SPR23 (680-236086-2)	6/7/23	11:15 Eastern		Water			X	2	
G6M-13-05X-SPR23 (680-236086-3)	6/7/23	09:35 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		10/13/23 16:00	Eurofins			
2						
3					6-14-23 1610	

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: Raw 0.7 - COR 0.5

MB

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236086-2

Login Number: 236086

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Refer to Job Narrative for details.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236086-2

Login Number: 236086
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 06/13/23 11:31 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236086-2

Login Number: 236086
List Number: 3
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 06/14/23 03:19 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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1 2 3 4 5 6 7 8 9 10 11 12

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 7/6/2023 9:43:42 AM

JOB DESCRIPTION

Seres-Arcadis JV, LTM, AOC 32/43A, Spring 2023

JOB NUMBER

680-236128-3

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202:

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-236128-10	32M-01-13XBR-SPR23	Water	06/08/23 15:50	06/10/23 09:32
680-236128-11	32M-01-14XOB-SPR23	Water	06/09/23 10:15	06/10/23 09:32
680-236128-12	32M-01-18XBR-SPR23	Water	06/09/23 10:00	06/10/23 09:32
680-236128-13	32M-DUP01-SPR23	Water	06/09/23 10:00	06/10/23 09:32
680-236128-14	32M-TB-01-SPR23	Water	06/09/23 00:00	06/10/23 09:32

Job ID: 680-236128-3

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-236128-3

Receipt
The samples were received on 6/10/2023 9:32 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.7°C and 5.7°C

GC/MS VOA
Method 8260D_DOD5: The continuing calibration verification (CCV) associated with batch 680-784926 recovered above the upper control limit for Acetone, Bromomethane, Chloroethane, Chloromethane, Dichlorodifluoromethane, 1,3-Dichloropropane, 2-Hexanone, Trichlorofluoromethane and Vinyl chloride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8260D_DOD5: The laboratory control sample (LCS) for analytical batch 680-784926 recovered outside control limits for the following analytes: Chloromethane, Dichlorodifluoromethane, 1,3-Dichloropropane and Vinyl chloride. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260D_DOD5: The laboratory control sample duplicate (LCSD) for analytical batch 680-784926 recovered outside control limits for the following analytes: Chloroethane, Chloromethane, Dichlorodifluoromethane, 1,3-Dichloropropane and Vinyl chloride. These analytes were biased high in the LCSD and were not detected in the associated samples; therefore, the data have been reported.

Method 8260D_DOD5: The method blank for analytical batch 680-784926 contained Hexachlorobutadiene and 1,2,4-Trichlorobenzene above the method detection limit (MDL). Associated samples were not re-analyzed because results were less than the reporting limit (RL) OR practical quantitation limit (PQL).

Method 8260D_DOD5: The closing continuing calibration verification (CCVC) associated with batch 680-784926 recovered above the upper control limit for Dichlorodifluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8260D_DOD5: The initial calibration verification (ICV) analyzed in batch 680-784451 was outside method criteria for the following analyte(s): Trichlorofluoromethane. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D_DOD5: The initial calibration verification (ICV) analyzed in batch 680-784480 was outside method criteria for the following analyte(s): Bromomethane, Chloroethane, Dichlorodifluoromethane, 1,1-Dichloroethane, trans-1,2-Dichloroethene, Trichlorofluoromethane and Vinyl chloride. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D_DOD5: The continuing calibration verification cap (CCVC) analyzed in batch 680-785235 was outside the method criteria for the following analyte(s): Bromomethane and Vinyl acetate. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D_DOD5: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-785235 recovered outside control limits for the following analytes: Vinyl acetate. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260D_DOD5: The continuing calibration verification (CCV) analyzed in batch 680-785235 was outside the method criteria for the following analyte(s): Bromoform and Vinyl acetate. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D_DOD5: Surrogate recovery for the following sample was outside the upper control limit: 32M-DUP01-SPR23

Job ID: 680-236128-3 (Continued)

Laboratory: Eurofins Savannah (Continued)

(680-236128-13). The sample was reanalyzed and both sets of data have been reported.

Method 8260D_DOD5: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to failure of quality control parameters in the initial analysis. 32M-DUP01-SPR23 (680-236128-13)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Hydrocarbons

Method MAVPH: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): 32M-01-14XOB-SPR23 (680-236128-11).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-01-13XBR-SPR23
Date Collected: 06/08/23 15:50
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-10
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U Q	25	10	3.7	ug/L		06/22/23 18:10	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 18:10	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/22/23 18:10	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/22/23 18:10	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 18:10	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		06/22/23 18:10	1
Bromomethane	10	U Q	20	10	3.7	ug/L		06/22/23 18:10	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/22/23 18:10	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/22/23 18:10	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/22/23 18:10	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 18:10	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 18:10	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/22/23 18:10	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/22/23 18:10	1
Chloroethane	10	U Q	20	10	4.6	ug/L		06/22/23 18:10	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 18:10	1
Chloromethane	2.0	U Q	2.5	2.0	0.54	ug/L		06/22/23 18:10	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/22/23 18:10	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/22/23 18:10	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/22/23 18:10	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/22/23 18:10	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 18:10	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/22/23 18:10	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 18:10	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 18:10	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 18:10	1
Dichlorodifluoromethane	1.0	U Q	2.0	1.0	0.36	ug/L		06/22/23 18:10	1
1,1-Dichloroethane	1.0	U Q	2.0	1.0	0.33	ug/L		06/22/23 18:10	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/22/23 18:10	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 18:10	1
trans-1,2-Dichloroethene	1.0	U Q	2.0	1.0	0.34	ug/L		06/22/23 18:10	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/22/23 18:10	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 18:10	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/22/23 18:10	1
1,3-Dichloropropane	1.0	U Q	2.0	1.0	0.36	ug/L		06/22/23 18:10	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/22/23 18:10	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/22/23 18:10	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 18:10	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/22/23 18:10	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/22/23 18:10	1
Hexachlorobutadiene	1.0	U Q	5.0	1.0	0.22	ug/L		06/22/23 18:10	1
2-Hexanone	10	U Q	20	10	3.2	ug/L		06/22/23 18:10	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 18:10	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/22/23 18:10	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/22/23 18:10	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/22/23 18:10	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/22/23 18:10	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/22/23 18:10	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/22/23 18:10	1

Client Sample ID: 32M-01-13XBR-SPR23
Lab Sample ID: 680-236128-10

Date Collected: 06/08/23 15:50
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 18:10	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/22/23 18:10	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/22/23 18:10	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/22/23 18:10	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 18:10	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/22/23 18:10	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/22/23 18:10	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/22/23 18:10	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/22/23 18:10	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/22/23 18:10	1
Trichlorofluoromethane	1.0	U Q	2.0	1.0	0.33	ug/L		06/22/23 18:10	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/22/23 18:10	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 18:10	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/22/23 18:10	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		06/22/23 18:10	1
Vinyl chloride	1.0	U Q	2.0	1.0	0.40	ug/L		06/22/23 18:10	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 18:10	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/22/23 18:10	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/22/23 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*89 - 112*		*06/22/23 18:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*81 - 118*		*06/22/23 18:10*	*1*
4-Bromofluorobenzene (Surr)	*109*		*85 - 114*		*06/22/23 18:10*	*1*
Dibromofluoromethane (Surr)	*114*		*80 - 119*		*06/22/23 18:10*	*1*

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 21:11	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 21:11	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 21:11	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 21:11	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 21:11	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 21:11	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 21:11	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 21:11	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 21:11	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 21:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*		*06/21/23 21:11*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	**17**		10	5.0	1.3	ug/L		06/14/23 14:22	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.1**	**J**	5.0	3.0	0.86	ug/L		06/15/23 00:42	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-01-14XOB-SPR23
Date Collected: 06/09/23 10:15
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-11
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 23:10	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 23:10	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 23:10	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 23:10	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 23:10	1
Bromoform	2.0	U Q	2.5	2.0	0.59	ug/L		06/23/23 23:10	1
Bromomethane	10	U Q	20	10	3.7	ug/L		06/23/23 23:10	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 23:10	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 23:10	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 23:10	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 23:10	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 23:10	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 23:10	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 23:10	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 23:10	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 23:10	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 23:10	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 23:10	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 23:10	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 23:10	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 23:10	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 23:10	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 23:10	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 23:10	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 23:10	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 23:10	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 23:10	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 23:10	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/23/23 23:10	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 23:10	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 23:10	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 23:10	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 23:10	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 23:10	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 23:10	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 23:10	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 23:10	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 23:10	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 23:10	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 23:10	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 23:10	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/23/23 23:10	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 23:10	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 23:10	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 23:10	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 23:10	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 23:10	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 23:10	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 23:10	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-01-14XOB-SPR23
Date Collected: 06/09/23 10:15
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-11
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 23:10	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 23:10	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 23:10	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 23:10	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 23:10	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 23:10	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 23:10	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 23:10	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 23:10	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 23:10	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 23:10	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 23:10	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 23:10	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 23:10	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		06/23/23 23:10	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 23:10	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 23:10	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 23:10	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 23:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*115*	*Q*	*89 - 112*		*06/23/23 23:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*81 - 118*		*06/23/23 23:10*	*1*
4-Bromofluorobenzene (Surr)	*104*		*85 - 114*		*06/23/23 23:10*	*1*
Dibromofluoromethane (Surr)	*123*	*Q*	*80 - 119*		*06/23/23 23:10*	*1*

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:18	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/22/23 09:18	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:18	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:18	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/22/23 09:18	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:18	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 09:18	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/22/23 09:18	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:18	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 09:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/22/23 09:18*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	**810**		10	5.0	1.3	ug/L		06/14/23 14:24	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**12**		5.0	3.0	0.86	ug/L		06/15/23 00:46	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-01-18XBR-SPR23
Date Collected: 06/09/23 10:00
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-12
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 20:58	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:58	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 20:58	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:58	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:58	1
Bromoform	2.0	U Q	2.5	2.0	0.59	ug/L		06/23/23 20:58	1
Bromomethane	10	U Q	20	10	3.7	ug/L		06/23/23 20:58	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 20:58	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 20:58	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 20:58	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:58	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:58	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 20:58	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 20:58	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 20:58	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:58	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 20:58	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 20:58	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 20:58	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 20:58	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 20:58	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:58	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:58	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:58	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:58	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:58	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:58	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:58	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/23/23 20:58	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:58	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:58	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 20:58	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:58	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 20:58	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:58	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 20:58	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 20:58	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:58	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 20:58	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 20:58	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 20:58	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/23/23 20:58	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:58	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 20:58	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 20:58	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 20:58	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 20:58	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 20:58	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 20:58	1

Client Sample ID: 32M-01-18XBR-SPR23
Lab Sample ID: 680-236128-12

Date Collected: 06/09/23 10:00
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:58	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:58	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 20:58	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 20:58	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:58	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 20:58	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 20:58	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 20:58	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 20:58	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 20:58	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:58	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 20:58	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:58	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 20:58	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		06/23/23 20:58	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 20:58	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:58	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 20:58	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 20:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*119*	*Q*	*89 - 112*		*06/23/23 20:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*118*		*81 - 118*		*06/23/23 20:58*	*1*
4-Bromofluorobenzene (Surr)	*107*		*85 - 114*		*06/23/23 20:58*	*1*
Dibromofluoromethane (Surr)	*128*	*Q*	*80 - 119*		*06/23/23 20:58*	*1*

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:59	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/22/23 09:59	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:59	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:59	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/22/23 09:59	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:59	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 09:59	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/22/23 09:59	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 09:59	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 09:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*		*06/22/23 09:59*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	**1300**		10	5.0	1.3	ug/L		06/14/23 14:26	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**2.5**	**J**	5.0	3.0	0.86	ug/L		06/15/23 00:50	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-DUP01-SPR23
Date Collected: 06/09/23 10:00
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-13
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 21:20	1
Acetone	10	U H	25	10	3.7	ug/L		06/26/23 15:52	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 21:20	1
Benzene	1.0	U H	2.0	1.0	0.27	ug/L		06/26/23 15:52	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 21:20	1
Bromobenzene	0.50	U H	1.0	0.50	0.24	ug/L		06/26/23 15:52	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 21:20	1
Chlorobromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/26/23 15:52	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 21:20	1
Dichlorobromomethane	1.0	U H	2.0	1.0	0.25	ug/L		06/26/23 15:52	1
Bromoform	2.0	U Q	2.5	2.0	0.59	ug/L		06/23/23 21:20	1
Bromoform	2.0	U H	2.5	2.0	0.59	ug/L		06/26/23 15:52	1
Bromomethane	10	U Q	20	10	3.7	ug/L		06/23/23 21:20	1
Bromomethane	10	U H	20	10	3.7	ug/L		06/26/23 15:52	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 21:20	1
2-Butanone (MEK)	20	U H Q	25	20	6.4	ug/L		06/26/23 15:52	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 21:20	1
n-Butylbenzene	2.0	U H	2.5	2.0	0.52	ug/L		06/26/23 15:52	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 21:20	1
sec-Butylbenzene	2.0	U H	2.5	2.0	0.53	ug/L		06/26/23 15:52	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 21:20	1
tert-Butylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/26/23 15:52	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 21:20	1
Carbon disulfide	1.0	U H	2.0	1.0	0.43	ug/L		06/26/23 15:52	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 21:20	1
Carbon tetrachloride	1.0	U H	2.0	1.0	0.30	ug/L		06/26/23 15:52	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 21:20	1
Chlorobenzene	0.50	U H	1.0	0.50	0.15	ug/L		06/26/23 15:52	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 21:20	1
Chloroethane	10	U H	20	10	4.6	ug/L		06/26/23 15:52	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 21:20	1
Chloroform	1.0	U H	2.0	1.0	0.27	ug/L		06/26/23 15:52	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 21:20	1
Chloromethane	2.0	U H	2.5	2.0	0.54	ug/L		06/26/23 15:52	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 21:20	1
2-Chlorotoluene	0.50	U H	1.0	0.50	0.25	ug/L		06/26/23 15:52	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 21:20	1
4-Chlorotoluene	1.0	U H	2.0	1.0	0.41	ug/L		06/26/23 15:52	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 21:20	1
Chlorodibromomethane	1.0	U H	2.0	1.0	0.39	ug/L		06/26/23 15:52	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 21:20	1
1,2-Dibromo-3-Chloropropane	5.0	U H	10	5.0	1.8	ug/L		06/26/23 15:52	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 21:20	1
Ethylene Dibromide	1.0	U H	2.0	1.0	0.33	ug/L		06/26/23 15:52	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 21:20	1
Dibromomethane	1.0	U H	2.0	1.0	0.34	ug/L		06/26/23 15:52	1
1,2-Dichlorobenzene	**0.31**	**J**	2.0	1.0	0.31	ug/L		06/23/23 21:20	1
1,2-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/26/23 15:52	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 21:20	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-DUP01-SPR23
Date Collected: 06/09/23 10:00
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-13
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,3-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/26/23 15:52	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 21:20	1
1,4-Dichlorobenzene	1.0	U H	2.0	1.0	0.31	ug/L		06/26/23 15:52	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 21:20	1
Dichlorodifluoromethane	1.0	U H	2.0	1.0	0.36	ug/L		06/26/23 15:52	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 21:20	1
1,1-Dichloroethane	1.0	U H	2.0	1.0	0.33	ug/L		06/26/23 15:52	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/23/23 21:20	1
1,2-Dichloroethane	1.0	U H	2.0	1.0	0.25	ug/L		06/26/23 15:52	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 21:20	1
cis-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.25	ug/L		06/26/23 15:52	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 21:20	1
trans-1,2-Dichloroethene	1.0	U H	2.0	1.0	0.34	ug/L		06/26/23 15:52	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 21:20	1
1,2-Dichloroethene, Total	1.0	U H	2.0	1.0	0.37	ug/L		06/26/23 15:52	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 21:20	1
1,1-Dichloroethene	1.0	U H	2.0	1.0	0.33	ug/L		06/26/23 15:52	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 21:20	1
1,2-Dichloropropane	0.50	U H	1.0	0.50	0.22	ug/L		06/26/23 15:52	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 21:20	1
1,3-Dichloropropane	1.0	U H	2.0	1.0	0.36	ug/L		06/26/23 15:52	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 21:20	1
2,2-Dichloropropane	1.0	U H	2.0	1.0	0.35	ug/L		06/26/23 15:52	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 21:20	1
1,1-Dichloropropene	1.0	U H	2.0	1.0	0.28	ug/L		06/26/23 15:52	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 21:20	1
cis-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.26	ug/L		06/26/23 15:52	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 21:20	1
trans-1,3-Dichloropropene	1.0	U H	2.0	1.0	0.23	ug/L		06/26/23 15:52	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 21:20	1
Ethylbenzene	0.50	U H	1.0	0.50	0.20	ug/L		06/26/23 15:52	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 21:20	1
Hexachlorobutadiene	1.0	U H	5.0	1.0	0.22	ug/L		06/26/23 15:52	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/23/23 21:20	1
2-Hexanone	10	U H Q M	20	10	3.2	ug/L		06/26/23 15:52	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 21:20	1
Isopropylbenzene	1.0	U H	2.0	1.0	0.26	ug/L		06/26/23 15:52	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 21:20	1
4-Isopropyltoluene	1.0	U H	2.0	1.0	0.44	ug/L		06/26/23 15:52	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 21:20	1
Methylene Chloride	10	U H	20	10	3.2	ug/L		06/26/23 15:52	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 21:20	1
4-Methyl-2-pentanone (MIBK)	10	U H Q	20	10	2.7	ug/L		06/26/23 15:52	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 21:20	1
Methyl tert-butyl ether	2.0	U H	5.0	2.0	0.81	ug/L		06/26/23 15:52	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 21:20	1
Naphthalene	5.0	U H	10	5.0	2.4	ug/L		06/26/23 15:52	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 21:20	1
N-Propylbenzene	1.0	U H	2.0	1.0	0.41	ug/L		06/26/23 15:52	1

Client Sample ID: 32M-DUP01-SPR23
Lab Sample ID: 680-236128-13

Date Collected: 06/09/23 10:00
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 21:20	1
Styrene	1.0	U H	2.0	1.0	0.27	ug/L		06/26/23 15:52	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 21:20	1
1,1,1,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.36	ug/L		06/26/23 15:52	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 21:20	1
1,1,2,2-Tetrachloroethane	1.0	U H	2.0	1.0	0.40	ug/L		06/26/23 15:52	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 21:20	1
Tetrachloroethene	1.0	U H	2.0	1.0	0.35	ug/L		06/26/23 15:52	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 21:20	1
Toluene	1.0	U H	2.0	1.0	0.25	ug/L		06/26/23 15:52	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 21:20	1
1,2,3-Trichlorobenzene	2.0	U H	5.0	2.0	0.81	ug/L		06/26/23 15:52	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 21:20	1
1,2,4-Trichlorobenzene	2.0	U H	5.0	2.0	0.53	ug/L		06/26/23 15:52	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 21:20	1
1,1,1-Trichloroethane	0.50	U H	1.0	0.50	0.21	ug/L		06/26/23 15:52	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 21:20	1
1,1,2-Trichloroethane	1.0	U H	2.0	1.0	0.32	ug/L		06/26/23 15:52	1
Trichloroethene	**0.35**	**J**	1.0	0.50	0.20	ug/L		06/23/23 21:20	1
Trichloroethene	0.50	U H M	1.0	0.50	0.20	ug/L		06/26/23 15:52	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 21:20	1
Trichlorofluoromethane	1.0	U H Q	2.0	1.0	0.33	ug/L		06/26/23 15:52	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 21:20	1
1,2,3-Trichloropropane	1.0	U H	2.0	1.0	0.48	ug/L		06/26/23 15:52	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 21:20	1
1,2,4-Trimethylbenzene	1.0	U H	2.0	1.0	0.43	ug/L		06/26/23 15:52	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 21:20	1
1,3,5-Trimethylbenzene	1.0	U H	2.0	1.0	0.28	ug/L		06/26/23 15:52	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		06/23/23 21:20	1
Vinyl acetate	2.0	U H	2.5	2.0	0.69	ug/L		06/26/23 15:52	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 21:20	1
Vinyl chloride	1.0	U H	2.0	1.0	0.40	ug/L		06/26/23 15:52	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 21:20	1
o-Xylene	1.0	U H	2.0	1.0	0.26	ug/L		06/26/23 15:52	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 21:20	1
m-Xylene & p-Xylene	1.0	U H	2.0	1.0	0.49	ug/L		06/26/23 15:52	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 21:20	1
Xylenes, Total	1.0	U H	2.0	1.0	0.49	ug/L		06/26/23 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*115*	*Q*	*89 - 112*		*06/23/23 21:20*	*1*
Toluene-d8 (Surr)	*106*		*89 - 112*		*06/26/23 15:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*81 - 118*		*06/23/23 21:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*81 - 118*		*06/26/23 15:52*	*1*
4-Bromofluorobenzene (Surr)	*103*		*85 - 114*		*06/23/23 21:20*	*1*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*06/26/23 15:52*	*1*
Dibromofluoromethane (Surr)	*124*	*Q*	*80 - 119*		*06/23/23 21:20*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 119*		*06/26/23 15:52*	*1*

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-DUP01-SPR23

Lab Sample ID: 680-236128-13

Date Collected: 06/09/23 10:00

Matrix: Water

Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 10:40	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/22/23 10:40	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 10:40	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 10:40	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/22/23 10:40	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 10:40	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 10:40	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/22/23 10:40	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/22/23 10:40	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/22/23 10:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*		*06/22/23 10:40*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	**1300**		10	5.0	1.3	ug/L		06/14/23 14:28	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.9**	**J**	5.0	3.0	0.86	ug/L		06/15/23 00:54	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-TB-01-SPR23
Date Collected: 06/09/23 00:00
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-14
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 20:36	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:36	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 20:36	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:36	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:36	1
Bromoform	2.0	U Q	2.5	2.0	0.59	ug/L		06/23/23 20:36	1
Bromomethane	10	U Q	20	10	3.7	ug/L		06/23/23 20:36	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 20:36	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 20:36	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 20:36	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:36	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:36	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 20:36	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 20:36	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 20:36	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:36	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 20:36	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 20:36	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 20:36	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 20:36	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 20:36	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:36	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:36	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:36	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:36	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 20:36	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:36	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:36	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/23/23 20:36	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:36	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 20:36	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 20:36	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:36	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 20:36	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:36	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 20:36	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 20:36	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:36	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 20:36	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 20:36	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 20:36	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/23/23 20:36	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:36	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 20:36	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 20:36	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 20:36	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 20:36	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 20:36	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 20:36	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Job ID: 680-236128-3

Client Sample ID: 32M-TB-01-SPR23
Date Collected: 06/09/23 00:00
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236128-14
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 20:36	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 20:36	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 20:36	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 20:36	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 20:36	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 20:36	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 20:36	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 20:36	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 20:36	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 20:36	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 20:36	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 20:36	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 20:36	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 20:36	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		06/23/23 20:36	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 20:36	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 20:36	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 20:36	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 20:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*114*	*Q*	*89 - 112*		*06/23/23 20:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*81 - 118*		*06/23/23 20:36*	*1*
4-Bromofluorobenzene (Surr)	*107*		*85 - 114*		*06/23/23 20:36*	*1*
Dibromofluoromethane (Surr)	*116*		*80 - 119*		*06/23/23 20:36*	*1*

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-784926/8
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/22/23 11:37	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 11:37	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/22/23 11:37	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/22/23 11:37	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 11:37	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		06/22/23 11:37	1
Bromomethane	10	U	20	10	3.7	ug/L		06/22/23 11:37	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/22/23 11:37	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/22/23 11:37	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/22/23 11:37	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 11:37	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 11:37	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/22/23 11:37	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/22/23 11:37	1
Chloroethane	10	U	20	10	4.6	ug/L		06/22/23 11:37	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 11:37	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/22/23 11:37	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/22/23 11:37	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/22/23 11:37	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/22/23 11:37	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/22/23 11:37	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 11:37	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/22/23 11:37	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 11:37	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 11:37	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/22/23 11:37	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/22/23 11:37	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 11:37	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/22/23 11:37	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 11:37	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/22/23 11:37	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/22/23 11:37	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 11:37	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/22/23 11:37	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/22/23 11:37	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/22/23 11:37	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/22/23 11:37	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 11:37	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/22/23 11:37	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/22/23 11:37	1
Hexachlorobutadiene	0.659	J	5.0	1.0	0.22	ug/L		06/22/23 11:37	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/22/23 11:37	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 11:37	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/22/23 11:37	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/22/23 11:37	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/22/23 11:37	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/22/23 11:37	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/22/23 11:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-784926/8
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/22/23 11:37	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/22/23 11:37	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/22/23 11:37	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/22/23 11:37	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/22/23 11:37	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/22/23 11:37	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/22/23 11:37	1
1,2,4-Trichlorobenzene	0.934	J	5.0	2.0	0.53	ug/L		06/22/23 11:37	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/22/23 11:37	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/22/23 11:37	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/22/23 11:37	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/22/23 11:37	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/22/23 11:37	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/22/23 11:37	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/22/23 11:37	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		06/22/23 11:37	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/22/23 11:37	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/22/23 11:37	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/22/23 11:37	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/22/23 11:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*89 - 112*		*06/22/23 11:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*81 - 118*		*06/22/23 11:37*	*1*
4-Bromofluorobenzene (Surr)	*112*		*85 - 114*		*06/22/23 11:37*	*1*
Dibromofluoromethane (Surr)	*111*		*80 - 119*		*06/22/23 11:37*	*1*

Lab Sample ID: LCS 680-784926/4
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	289		ug/L		116	39 - 160
Benzene	50.0	54.0		ug/L		108	79 - 120
Bromobenzene	50.0	57.8		ug/L		116	80 - 120
Chlorobromomethane	50.0	54.9		ug/L		110	78 - 123
Dichlorobromomethane	50.0	51.3		ug/L		103	79 - 125
Bromoform	50.0	47.8		ug/L		96	66 - 130
Bromomethane	50.0	66.9		ug/L		134	53 - 141
2-Butanone (MEK)	250	279		ug/L		112	56 - 143
n-Butylbenzene	50.0	48.6		ug/L		97	75 - 128
sec-Butylbenzene	50.0	51.8		ug/L		104	77 - 126
tert-Butylbenzene	50.0	51.9		ug/L		104	78 - 124
Carbon disulfide	50.0	54.3		ug/L		109	64 - 133
Carbon tetrachloride	50.0	45.5		ug/L		91	72 - 136
Chlorobenzene	50.0	53.3		ug/L		107	82 - 118
Chloroethane	50.0	67.6		ug/L		135	60 - 138
Chloroform	50.0	54.4		ug/L		109	79 - 124

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-784926/4
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloromethane	50.0	71.3	Q	ug/L		143	50 - 139
2-Chlorotoluene	50.0	53.1		ug/L		106	79 - 122
4-Chlorotoluene	50.0	54.7		ug/L		109	78 - 122
Chlorodibromomethane	50.0	53.9		ug/L		108	74 - 126
1,2-Dibromo-3-Chloropropane	50.0	45.3		ug/L		91	62 - 128
Ethylene Dibromide	50.0	57.6		ug/L		115	75 - 127
Dibromomethane	50.0	59.3		ug/L		119	79 - 123
1,2-Dichlorobenzene	50.0	56.1		ug/L		112	80 - 119
1,3-Dichlorobenzene	50.0	55.4		ug/L		111	80 - 119
1,4-Dichlorobenzene	50.0	52.6		ug/L		105	79 - 118
Dichlorodifluoromethane	50.0	80.8	Q	ug/L		162	32 - 152
1,1-Dichloroethane	50.0	52.6		ug/L		105	77 - 125
1,2-Dichloroethane	50.0	56.7		ug/L		113	73 - 128
cis-1,2-Dichloroethene	50.0	52.8		ug/L		106	78 - 123
trans-1,2-Dichloroethene	50.0	53.8		ug/L		108	75 - 124
1,2-Dichloroethene, Total	100	107		ug/L		107	79 - 121
1,1-Dichloroethene	50.0	54.6		ug/L		109	71 - 131
1,2-Dichloropropane	50.0	53.2		ug/L		106	78 - 122
1,3-Dichloropropane	50.0	59.8	Q	ug/L		120	80 - 119
2,2-Dichloropropane	50.0	46.2		ug/L		92	60 - 139
1,1-Dichloropropene	50.0	51.9		ug/L		104	79 - 125
cis-1,3-Dichloropropene	50.0	46.2		ug/L		92	75 - 124
trans-1,3-Dichloropropene	50.0	50.9		ug/L		102	73 - 127
Ethylbenzene	50.0	55.3		ug/L		111	79 - 121
Hexachlorobutadiene	50.0	58.0		ug/L		116	66 - 134
2-Hexanone	250	292		ug/L		117	57 - 139
Isopropylbenzene	50.0	55.0		ug/L		110	72 - 131
4-Isopropyltoluene	50.0	51.7		ug/L		103	77 - 127
Methylene Chloride	50.0	58.8		ug/L		118	74 - 124
4-Methyl-2-pentanone (MIBK)	250	282		ug/L		113	67 - 130
Methyl tert-butyl ether	50.0	53.4		ug/L		107	71 - 124
Naphthalene	50.0	52.9		ug/L		106	61 - 128
N-Propylbenzene	50.0	52.0		ug/L		104	76 - 126
Styrene	50.0	51.7		ug/L		103	78 - 123
1,1,1,2-Tetrachloroethane	50.0	47.6		ug/L		95	78 - 124
1,1,2,2-Tetrachloroethane	50.0	51.8		ug/L		104	71 - 121
Tetrachloroethene	50.0	58.0		ug/L		116	74 - 129
Toluene	50.0	57.4		ug/L		115	80 - 121
1,2,3-Trichlorobenzene	50.0	57.8		ug/L		116	69 - 129
1,2,4-Trichlorobenzene	50.0	48.7		ug/L		97	69 - 130
1,1,1-Trichloroethane	50.0	47.5		ug/L		95	74 - 131
1,1,2-Trichloroethane	50.0	55.5		ug/L		111	80 - 119
Trichloroethene	50.0	55.4		ug/L		111	79 - 123
Trichlorofluoromethane	50.0	62.4		ug/L		125	65 - 141
1,2,3-Trichloropropane	50.0	54.9		ug/L		110	73 - 122
1,2,4-Trimethylbenzene	50.0	51.2		ug/L		102	76 - 124
1,3,5-Trimethylbenzene	50.0	48.2		ug/L		96	75 - 124
Vinyl acetate	100	98.2		ug/L		98	54 - 146
Vinyl chloride	50.0	80.6	Q	ug/L		161	58 - 137

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-784926/4
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
o-Xylene	50.0	54.3		ug/L		109	78 - 122
m-Xylene & p-Xylene	50.0	49.9		ug/L		100	80 - 121
Xylenes, Total	100	104		ug/L		104	79 - 121

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*107*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*103*		*81 - 118*
4-Bromofluorobenzene (Surr)	*109*		*85 - 114*
Dibromofluoromethane (Surr)	*113*		*80 - 119*

Lab Sample ID: LCSD 680-784926/5
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	250	287		ug/L		115	39 - 160	1	20
Benzene	50.0	54.1		ug/L		108	79 - 120	0	20
Bromobenzene	50.0	57.4		ug/L		115	80 - 120	1	20
Chlorobromomethane	50.0	54.9		ug/L		110	78 - 123	0	20
Dichlorobromomethane	50.0	50.0		ug/L		100	79 - 125	3	20
Bromoform	50.0	46.8		ug/L		94	66 - 130	2	20
Bromomethane	50.0	70.2		ug/L		140	53 - 141	5	20
2-Butanone (MEK)	250	281		ug/L		112	56 - 143	1	20
n-Butylbenzene	50.0	48.7		ug/L		97	75 - 128	0	20
sec-Butylbenzene	50.0	51.7		ug/L		103	77 - 126	0	20
tert-Butylbenzene	50.0	53.0		ug/L		106	78 - 124	2	20
Carbon disulfide	50.0	51.5		ug/L		103	64 - 133	5	20
Carbon tetrachloride	50.0	46.7		ug/L		93	72 - 136	3	20
Chlorobenzene	50.0	53.7		ug/L		107	82 - 118	1	20
Chloroethane	50.0	71.1	Q	ug/L		142	60 - 138	5	20
Chloroform	50.0	54.1		ug/L		108	79 - 124	1	20
Chloromethane	50.0	74.0	Q	ug/L		148	50 - 139	4	20
2-Chlorotoluene	50.0	54.9		ug/L		110	79 - 122	3	20
4-Chlorotoluene	50.0	55.0		ug/L		110	78 - 122	1	20
Chlorodibromomethane	50.0	54.4		ug/L		109	74 - 126	1	20
1,2-Dibromo-3-Chloropropane	50.0	45.2		ug/L		90	62 - 128	0	20
Ethylene Dibromide	50.0	58.4		ug/L		117	75 - 127	1	20
Dibromomethane	50.0	59.6		ug/L		119	79 - 123	0	20
1,2-Dichlorobenzene	50.0	55.6		ug/L		111	80 - 119	1	20
1,3-Dichlorobenzene	50.0	54.7		ug/L		109	80 - 119	1	20
1,4-Dichlorobenzene	50.0	53.0		ug/L		106	79 - 118	1	20
Dichlorodifluoromethane	50.0	82.9	Q	ug/L		166	32 - 152	3	20
1,1-Dichloroethane	50.0	53.2		ug/L		106	77 - 125	1	20
1,2-Dichloroethane	50.0	55.4		ug/L		111	73 - 128	2	20
cis-1,2-Dichloroethene	50.0	52.7		ug/L		105	78 - 123	0	20
trans-1,2-Dichloroethene	50.0	54.1		ug/L		108	75 - 124	1	20
1,2-Dichloroethene, Total	100	107		ug/L		107	79 - 121	0	20
1,1-Dichloroethene	50.0	55.3		ug/L		111	71 - 131	1	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-784926/5
Matrix: Water
Analysis Batch: 784926

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2-Dichloropropane	50.0	53.2		ug/L		106	78 - 122	0	20
1,3-Dichloropropane	50.0	60.6	Q	ug/L		121	80 - 119	1	20
2,2-Dichloropropane	50.0	46.7		ug/L		93	60 - 139	1	20
1,1-Dichloropropene	50.0	52.8		ug/L		106	79 - 125	2	20
cis-1,3-Dichloropropene	50.0	47.1		ug/L		94	75 - 124	2	20
trans-1,3-Dichloropropene	50.0	51.0		ug/L		102	73 - 127	0	20
Ethylbenzene	50.0	54.8		ug/L		110	79 - 121	1	20
Hexachlorobutadiene	50.0	60.6		ug/L		121	66 - 134	4	20
2-Hexanone	250	290		ug/L		116	57 - 139	1	20
Isopropylbenzene	50.0	54.0		ug/L		108	72 - 131	2	20
4-Isopropyltoluene	50.0	51.1		ug/L		102	77 - 127	1	20
Methylene Chloride	50.0	56.6		ug/L		113	74 - 124	4	20
4-Methyl-2-pentanone (MIBK)	250	278		ug/L		111	67 - 130	2	20
Methyl tert-butyl ether	50.0	53.4		ug/L		107	71 - 124	0	20
Naphthalene	50.0	54.6		ug/L		109	61 - 128	3	20
N-Propylbenzene	50.0	53.5		ug/L		107	76 - 126	3	20
Styrene	50.0	50.5		ug/L		101	78 - 123	2	20
1,1,1,2-Tetrachloroethane	50.0	47.0		ug/L		94	78 - 124	1	20
1,1,2,2-Tetrachloroethane	50.0	50.2		ug/L		100	71 - 121	3	20
Tetrachloroethene	50.0	58.8		ug/L		118	74 - 129	1	20
Toluene	50.0	58.4		ug/L		117	80 - 121	2	20
1,2,3-Trichlorobenzene	50.0	59.3		ug/L		119	69 - 129	3	20
1,2,4-Trichlorobenzene	50.0	51.2		ug/L		102	69 - 130	5	20
1,1,1-Trichloroethane	50.0	47.2		ug/L		94	74 - 131	1	20
1,1,2-Trichloroethane	50.0	55.9		ug/L		112	80 - 119	1	20
Trichloroethene	50.0	56.1		ug/L		112	79 - 123	1	20
Trichlorofluoromethane	50.0	64.6		ug/L		129	65 - 141	3	20
1,2,3-Trichloropropane	50.0	53.5		ug/L		107	73 - 122	3	20
1,2,4-Trimethylbenzene	50.0	50.9		ug/L		102	76 - 124	1	20
1,3,5-Trimethylbenzene	50.0	49.9		ug/L		100	75 - 124	3	20
Vinyl acetate	100	98.0		ug/L		98	54 - 146	0	20
Vinyl chloride	50.0	84.9	Q	ug/L		170	58 - 137	5	20
o-Xylene	50.0	53.1		ug/L		106	78 - 122	2	20
m-Xylene & p-Xylene	50.0	48.2		ug/L		96	80 - 121	3	20
Xylenes, Total	100	101		ug/L		101	79 - 121	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*110*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*105*		*81 - 118*
4-Bromofluorobenzene (Surr)	*102*		*85 - 114*
Dibromofluoromethane (Surr)	*112*		*80 - 119*

Lab Sample ID: MB 680-785235/9
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acetone	10	U	25	10	3.7	ug/L		06/23/23 17:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-785235/9
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 17:41	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		06/23/23 17:41	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 17:41	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 17:41	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		06/23/23 17:41	1
Bromomethane	10	U	20	10	3.7	ug/L		06/23/23 17:41	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		06/23/23 17:41	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		06/23/23 17:41	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		06/23/23 17:41	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 17:41	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 17:41	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		06/23/23 17:41	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		06/23/23 17:41	1
Chloroethane	10	U	20	10	4.6	ug/L		06/23/23 17:41	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 17:41	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		06/23/23 17:41	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		06/23/23 17:41	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 17:41	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		06/23/23 17:41	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		06/23/23 17:41	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 17:41	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 17:41	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 17:41	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 17:41	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		06/23/23 17:41	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 17:41	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 17:41	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		06/23/23 17:41	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 17:41	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		06/23/23 17:41	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		06/23/23 17:41	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 17:41	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		06/23/23 17:41	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 17:41	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 17:41	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 17:41	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 17:41	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		06/23/23 17:41	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 17:41	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		06/23/23 17:41	1
2-Hexanone	10	U	20	10	3.2	ug/L		06/23/23 17:41	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 17:41	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		06/23/23 17:41	1
Methylene Chloride	10	U	20	10	3.2	ug/L		06/23/23 17:41	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		06/23/23 17:41	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 17:41	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		06/23/23 17:41	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		06/23/23 17:41	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		06/23/23 17:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-785235/9
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		06/23/23 17:41	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 17:41	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		06/23/23 17:41	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		06/23/23 17:41	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		06/23/23 17:41	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		06/23/23 17:41	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		06/23/23 17:41	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		06/23/23 17:41	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		06/23/23 17:41	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		06/23/23 17:41	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		06/23/23 17:41	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		06/23/23 17:41	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		06/23/23 17:41	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		06/23/23 17:41	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		06/23/23 17:41	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		06/23/23 17:41	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 17:41	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		06/23/23 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*116*	*Q*	*89 - 112*		*06/23/23 17:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*111*		*81 - 118*		*06/23/23 17:41*	*1*
4-Bromofluorobenzene (Surr)	*107*		*85 - 114*		*06/23/23 17:41*	*1*
Dibromofluoromethane (Surr)	*119*		*80 - 119*		*06/23/23 17:41*	*1*

Lab Sample ID: LCS 680-785235/5
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	243		ug/L		97	39 - 160
Benzene	50.0	46.8		ug/L		94	79 - 120
Bromobenzene	50.0	49.0		ug/L		98	80 - 120
Chlorobromomethane	50.0	42.5		ug/L		85	78 - 123
Dichlorobromomethane	50.0	44.8		ug/L		90	79 - 125
Bromoform	50.0	40.3		ug/L		81	66 - 130
Bromomethane	50.0	54.7		ug/L		109	53 - 141
2-Butanone (MEK)	250	237		ug/L		95	56 - 143
n-Butylbenzene	50.0	51.3		ug/L		103	75 - 128
sec-Butylbenzene	50.0	45.2		ug/L		90	77 - 126
tert-Butylbenzene	50.0	45.5		ug/L		91	78 - 124
Carbon disulfide	50.0	43.8		ug/L		88	64 - 133
Carbon tetrachloride	50.0	43.1		ug/L		86	72 - 136
Chlorobenzene	50.0	47.8		ug/L		96	82 - 118
Chloroethane	50.0	46.5		ug/L		93	60 - 138
Chloroform	50.0	44.4		ug/L		89	79 - 124
Chloromethane	50.0	43.1		ug/L		86	50 - 139
2-Chlorotoluene	50.0	46.3		ug/L		93	79 - 122

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-785235/5
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4-Chlorotoluene	50.0	47.6		ug/L		95	78 - 122
Chlorodibromomethane	50.0	49.4		ug/L		99	74 - 126
1,2-Dibromo-3-Chloropropane	50.0	44.9		ug/L		90	62 - 128
Ethylene Dibromide	50.0	46.4		ug/L		93	75 - 127
Dibromomethane	50.0	47.0		ug/L		94	79 - 123
1,2-Dichlorobenzene	50.0	48.2		ug/L		96	80 - 119
1,3-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 119
1,4-Dichlorobenzene	50.0	48.3		ug/L		97	79 - 118
Dichlorodifluoromethane	50.0	42.5		ug/L		85	32 - 152
1,1-Dichloroethane	50.0	44.4		ug/L		89	77 - 125
1,2-Dichloroethane	50.0	43.4		ug/L		87	73 - 128
cis-1,2-Dichloroethene	50.0	48.1		ug/L		96	78 - 123
trans-1,2-Dichloroethene	50.0	47.3		ug/L		95	75 - 124
1,2-Dichloroethene, Total	100	95.4		ug/L		95	79 - 121
1,1-Dichloroethene	50.0	49.0		ug/L		98	71 - 131
1,2-Dichloropropane	50.0	48.5		ug/L		97	78 - 122
1,3-Dichloropropane	50.0	50.9		ug/L		102	80 - 119
2,2-Dichloropropane	50.0	54.6		ug/L		109	60 - 139
1,1-Dichloropropene	50.0	46.3		ug/L		93	79 - 125
cis-1,3-Dichloropropene	50.0	44.3		ug/L		89	75 - 124
trans-1,3-Dichloropropene	50.0	47.0		ug/L		94	73 - 127
Ethylbenzene	50.0	47.8		ug/L		96	79 - 121
Hexachlorobutadiene	50.0	48.6		ug/L		97	66 - 134
2-Hexanone	250	280		ug/L		112	57 - 139
Isopropylbenzene	50.0	47.7		ug/L		95	72 - 131
4-Isopropyltoluene	50.0	48.1		ug/L		96	77 - 127
Methylene Chloride	50.0	45.0		ug/L		90	74 - 124
4-Methyl-2-pentanone (MIBK)	250	265		ug/L		106	67 - 130
Methyl tert-butyl ether	50.0	50.0		ug/L		100	71 - 124
Naphthalene	50.0	52.1		ug/L		104	61 - 128
N-Propylbenzene	50.0	46.0		ug/L		92	76 - 126
Styrene	50.0	50.0		ug/L		100	78 - 123
1,1,1,2-Tetrachloroethane	50.0	44.7		ug/L		89	78 - 124
1,1,2,2-Tetrachloroethane	50.0	58.6		ug/L		117	71 - 121
Tetrachloroethene	50.0	46.2		ug/L		92	74 - 129
Toluene	50.0	46.0		ug/L		92	80 - 121
1,2,3-Trichlorobenzene	50.0	50.3		ug/L		101	69 - 129
1,2,4-Trichlorobenzene	50.0	51.9		ug/L		104	69 - 130
1,1,1-Trichloroethane	50.0	44.8		ug/L		90	74 - 131
1,1,2-Trichloroethane	50.0	50.3		ug/L		101	80 - 119
Trichloroethene	50.0	42.1		ug/L		84	79 - 123
Trichlorofluoromethane	50.0	44.2		ug/L		88	65 - 141
1,2,3-Trichloropropane	50.0	51.9		ug/L		104	73 - 122
1,2,4-Trimethylbenzene	50.0	46.3		ug/L		93	76 - 124
1,3,5-Trimethylbenzene	50.0	46.5		ug/L		93	75 - 124
Vinyl acetate	100	337	J1 Q	ug/L		337	54 - 146
Vinyl chloride	50.0	44.8		ug/L		90	58 - 137
o-Xylene	50.0	46.2		ug/L		92	78 - 122
m-Xylene & p-Xylene	50.0	46.4		ug/L		93	80 - 121

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-785235/5
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Xylenes, Total			100	92.6		ug/L		93	79 - 121		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*94*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*90*		*81 - 118*
4-Bromofluorobenzene (Surr)	*106*		*85 - 114*
Dibromofluoromethane (Surr)	*93*		*80 - 119*

Lab Sample ID: LCSD 680-785235/6
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone			250	249		ug/L		100	39 - 160	2	20
Benzene			50.0	46.2		ug/L		92	79 - 120	1	20
Bromobenzene			50.0	48.4		ug/L		97	80 - 120	1	20
Chlorobromomethane			50.0	42.1		ug/L		84	78 - 123	1	20
Dichlorobromomethane			50.0	44.6		ug/L		89	79 - 125	0	20
Bromoform			50.0	39.8		ug/L		80	66 - 130	1	20
Bromomethane			50.0	54.5		ug/L		109	53 - 141	0	20
2-Butanone (MEK)			250	238		ug/L		95	56 - 143	0	20
n-Butylbenzene			50.0	50.0		ug/L		100	75 - 128	3	20
sec-Butylbenzene			50.0	44.5		ug/L		89	77 - 126	2	20
tert-Butylbenzene			50.0	44.9		ug/L		90	78 - 124	1	20
Carbon disulfide			50.0	42.9		ug/L		86	64 - 133	2	20
Carbon tetrachloride			50.0	42.9		ug/L		86	72 - 136	0	20
Chlorobenzene			50.0	47.6		ug/L		95	82 - 118	0	20
Chloroethane			50.0	45.1		ug/L		90	60 - 138	3	20
Chloroform			50.0	42.8		ug/L		86	79 - 124	4	20
Chloromethane			50.0	43.0		ug/L		86	50 - 139	0	20
2-Chlorotoluene			50.0	45.9		ug/L		92	79 - 122	1	20
4-Chlorotoluene			50.0	46.7		ug/L		93	78 - 122	2	20
Chlorodibromomethane			50.0	49.1		ug/L		98	74 - 126	1	20
1,2-Dibromo-3-Chloropropane			50.0	44.8		ug/L		90	62 - 128	0	20
Ethylene Dibromide			50.0	46.5		ug/L		93	75 - 127	0	20
Dibromomethane			50.0	47.0		ug/L		94	79 - 123	0	20
1,2-Dichlorobenzene			50.0	47.5		ug/L		95	80 - 119	1	20
1,3-Dichlorobenzene			50.0	47.9		ug/L		96	80 - 119	2	20
1,4-Dichlorobenzene			50.0	46.9		ug/L		94	79 - 118	3	20
Dichlorodifluoromethane			50.0	42.3		ug/L		85	32 - 152	1	20
1,1-Dichloroethane			50.0	43.5		ug/L		87	77 - 125	2	20
1,2-Dichloroethane			50.0	43.3		ug/L		87	73 - 128	0	20
cis-1,2-Dichloroethene			50.0	47.4		ug/L		95	78 - 123	1	20
trans-1,2-Dichloroethene			50.0	46.3		ug/L		93	75 - 124	2	20
1,2-Dichloroethene, Total			100	93.7		ug/L		94	79 - 121	2	20
1,1-Dichloroethene			50.0	47.6		ug/L		95	71 - 131	3	20
1,2-Dichloropropane			50.0	47.4		ug/L		95	78 - 122	2	20
1,3-Dichloropropane			50.0	51.3		ug/L		103	80 - 119	1	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-785235/6
Matrix: Water
Analysis Batch: 785235

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,2-Dichloropropane			50.0	52.8		ug/L		106	60 - 139	3	20
1,1-Dichloropropene			50.0	46.6		ug/L		93	79 - 125	1	20
cis-1,3-Dichloropropene			50.0	43.7		ug/L		87	75 - 124	1	20
trans-1,3-Dichloropropene			50.0	46.6		ug/L		93	73 - 127	1	20
Ethylbenzene			50.0	47.0		ug/L		94	79 - 121	2	20
Hexachlorobutadiene			50.0	47.3		ug/L		95	66 - 134	3	20
2-Hexanone			250	286		ug/L		114	57 - 139	2	20
Isopropylbenzene			50.0	47.5		ug/L		95	72 - 131	1	20
4-Isopropyltoluene			50.0	47.0		ug/L		94	77 - 127	2	20
Methylene Chloride			50.0	45.6		ug/L		91	74 - 124	1	20
4-Methyl-2-pentanone (MIBK)			250	271		ug/L		108	67 - 130	2	20
Methyl tert-butyl ether			50.0	50.0		ug/L		100	71 - 124	0	20
Naphthalene			50.0	51.1		ug/L		102	61 - 128	2	20
N-Propylbenzene			50.0	45.6		ug/L		91	76 - 126	1	20
Styrene			50.0	49.2		ug/L		98	78 - 123	2	20
1,1,1,2-Tetrachloroethane			50.0	44.1		ug/L		88	78 - 124	1	20
1,1,2,2-Tetrachloroethane			50.0	59.2		ug/L		118	71 - 121	1	20
Tetrachloroethene			50.0	45.0		ug/L		90	74 - 129	3	20
Toluene			50.0	45.1		ug/L		90	80 - 121	2	20
1,2,3-Trichlorobenzene			50.0	48.6		ug/L		97	69 - 129	3	20
1,2,4-Trichlorobenzene			50.0	50.3		ug/L		101	69 - 130	3	20
1,1,1-Trichloroethane			50.0	44.4		ug/L		89	74 - 131	1	20
1,1,2-Trichloroethane			50.0	50.9		ug/L		102	80 - 119	1	20
Trichloroethene			50.0	41.7		ug/L		83	79 - 123	1	20
Trichlorofluoromethane			50.0	43.4		ug/L		87	65 - 141	2	20
1,2,3-Trichloropropane			50.0	52.3		ug/L		105	73 - 122	1	20
1,2,4-Trimethylbenzene			50.0	45.2		ug/L		90	76 - 124	3	20
1,3,5-Trimethylbenzene			50.0	44.7		ug/L		89	75 - 124	4	20
Vinyl acetate			100	337	J1 Q	ug/L		337	54 - 146	0	20
Vinyl chloride			50.0	43.7		ug/L		87	58 - 137	3	20
o-Xylene			50.0	44.9		ug/L		90	78 - 122	3	20
m-Xylene & p-Xylene			50.0	46.3		ug/L		93	80 - 121	0	20
Xylenes, Total			100	91.2		ug/L		91	79 - 121	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*94*		*89 - 112*
1,2-Dichloroethane-d4 (Surr)	*87*		*81 - 118*
4-Bromofluorobenzene (Surr)	*105*		*85 - 114*
Dibromofluoromethane (Surr)	*92*		*80 - 119*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-389210/2
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 14:21	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 410-389210/2
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 14:21	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 14:21	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 14:21	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 14:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 14:21*	*1*

Lab Sample ID: LCS 410-389210/3
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			50.1	47.6		ug/L		95	70 - 130		
C9-C10 Aromatics			50.2	50.1	J	ug/L		100	70 - 130		
Ethylbenzene			50.1	48.9		ug/L		98	70 - 130		
Methyl tert-butyl ether			50.2	45.9		ug/L		92	70 - 130		
Naphthalene			50.2	52.1		ug/L		104	70 - 130		
Toluene			50.1	48.0		ug/L		96	70 - 130		
m-Xylene & p-Xylene			101	100		ug/L		99	70 - 130		
o-Xylene			50.4	49.4		ug/L		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*

Lab Sample ID: LCSD 410-389210/4
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene			50.1	47.9		ug/L		96	70 - 130	1	25
C9-C10 Aromatics			50.2	49.7	J	ug/L		99	70 - 130	1	25
Ethylbenzene			50.1	49.0		ug/L		98	70 - 130	0	25
Methyl tert-butyl ether			50.2	45.8		ug/L		91	70 - 130	0	25
Naphthalene			50.2	52.5		ug/L		105	70 - 130	1	25
Toluene			50.1	48.2		ug/L		96	70 - 130	0	25
m-Xylene & p-Xylene			101	100		ug/L		100	70 - 130	0	25
o-Xylene			50.4	49.6		ug/L		98	70 - 130	0	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-783510/1-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 13:44	1

Lab Sample ID: LCS 680-783510/2-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	400	441		ug/L		110	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-783511/1-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 23:33	1

Lab Sample ID: LCS 680-783511/2-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	111		ug/L		111	84 - 116

GC/MS VOA

Analysis Batch: 784926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total/NA	Water	8260D	
MB 680-784926/8	Method Blank	Total/NA	Water	8260D	
LCS 680-784926/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-784926/5	Lab Control Sample Dup	Total/NA	Water	8260D	

Analysis Batch: 785235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-11	32M-01-14XOB-SPR23	Total/NA	Water	8260D	
680-236128-12	32M-01-18XBR-SPR23	Total/NA	Water	8260D	
680-236128-13	32M-DUP01-SPR23	Total/NA	Water	8260D	
680-236128-14	32M-TB-01-SPR23	Total/NA	Water	8260D	
MB 680-785235/9	Method Blank	Total/NA	Water	8260D	
LCS 680-785235/5	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-785235/6	Lab Control Sample Dup	Total/NA	Water	8260D	

Analysis Batch: 785465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-13	32M-DUP01-SPR23	Total/NA	Water	8260D	

GC VOA

Analysis Batch: 389210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total/NA	Water	MAVPH	
680-236128-11	32M-01-14XOB-SPR23	Total/NA	Water	MAVPH	
680-236128-12	32M-01-18XBR-SPR23	Total/NA	Water	MAVPH	
680-236128-13	32M-DUP01-SPR23	Total/NA	Water	MAVPH	
MB 410-389210/2	Method Blank	Total/NA	Water	MAVPH	
LCS 410-389210/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 410-389210/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	

Metals

Prep Batch: 783510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total Recoverable	Water	3005A	
680-236128-11	32M-01-14XOB-SPR23	Total Recoverable	Water	3005A	
680-236128-12	32M-01-18XBR-SPR23	Total Recoverable	Water	3005A	
680-236128-13	32M-DUP01-SPR23	Total Recoverable	Water	3005A	
MB 680-783510/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783510/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total Recoverable	Water	3005A	
680-236128-11	32M-01-14XOB-SPR23	Total Recoverable	Water	3005A	
680-236128-12	32M-01-18XBR-SPR23	Total Recoverable	Water	3005A	
680-236128-13	32M-DUP01-SPR23	Total Recoverable	Water	3005A	
MB 680-783511/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783511/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals

Analysis Batch: 783688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total Recoverable	Water	6010C	783510
680-236128-11	32M-01-14XOB-SPR23	Total Recoverable	Water	6010C	783510
680-236128-12	32M-01-18XBR-SPR23	Total Recoverable	Water	6010C	783510
680-236128-13	32M-DUP01-SPR23	Total Recoverable	Water	6010C	783510
MB 680-783510/1-A	Method Blank	Total Recoverable	Water	6010C	783510
LCS 680-783510/2-A	Lab Control Sample	Total Recoverable	Water	6010C	783510

Analysis Batch: 783691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-10	32M-01-13XBR-SPR23	Total Recoverable	Water	6020A	783511
680-236128-11	32M-01-14XOB-SPR23	Total Recoverable	Water	6020A	783511
680-236128-12	32M-01-18XBR-SPR23	Total Recoverable	Water	6020A	783511
680-236128-13	32M-DUP01-SPR23	Total Recoverable	Water	6020A	783511
MB 680-783511/1-A	Method Blank	Total Recoverable	Water	6020A	783511
LCS 680-783511/2-A	Lab Control Sample	Total Recoverable	Water	6020A	783511

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202:

Client Sample ID: 32M-01-13XBR-SPR23
Lab Sample ID: 680-236128-10
Date Collected: 06/08/23 15:50
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	784926	06/22/23 18:10	P1C	EET SAV
	Instrument ID: CMSU									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 21:11	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:22	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:42	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 32M-01-14XOB-SPR23
Lab Sample ID: 680-236128-11
Date Collected: 06/09/23 10:15
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	785235	06/23/23 23:10	MLL	EET SAV
	Instrument ID: CMSAA									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/22/23 09:18	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:24	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:46	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 32M-01-18XBR-SPR23
Lab Sample ID: 680-236128-12
Date Collected: 06/09/23 10:00
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	785235	06/23/23 20:58	MLL	EET SAV
	Instrument ID: CMSAA									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/22/23 09:59	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:26	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:50	BWR	EET SAV
	Instrument ID: ICPMSC									

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202:

Client Sample ID: 32M-DUP01-SPR23
Lab Sample ID: 680-236128-13

Date Collected: 06/09/23 10:00
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	785235	06/23/23 21:20	MLL	EET SAV
	Instrument ID: CMSAA									
Total/NA	Analysis	8260D		1	5 mL	5 mL	785465	06/26/23 15:52	P1C	EET SAV
	Instrument ID: CMSAJ									
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/22/23 10:40	X875	ELLE
	Instrument ID: 10149									
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:28	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:54	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 32M-TB-01-SPR23
Lab Sample ID: 680-236128-14

Date Collected: 06/09/23 00:00
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	785235	06/23/23 20:36	MLL	EET SAV
	Instrument ID: CMSAA									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-24
Alaska	State	PA00009	06-30-23
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-23
California	State	2792	11-30-23
Colorado	State	PA00009	06-30-23
Connecticut	State	PH-0746	06-30-23
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-23
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-23
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-23
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-24
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	06-30-23
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-23
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	9804	08-31-23
Oregon	NELAP	PA200001	09-11-23
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704194-23-46	08-31-23
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-23
Virginia	NELAP	460182	06-14-24
Washington	State	C457	04-11-24
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-24
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-3
Project/Site: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 202

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds (GC/MS)	SW846	EET SAV
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	ELLE
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
5030C	Purge and Trap	SW846	EET SAV
5030C	Purge and Trap	SW846	ELLE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive Suite B7, Charleston SC 29492
(843) 619-370-0374 jennifer singer@arcadis com

COC # AOC32_43A_SP

Boston #215

US Army Corps of Engineers ®

Project Name Former Fort Devens, Long Term Monitoring	Laboratory Eurofins Environment Testing TestAmerica, Savannah, GA	Event Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Project Number DEVNS-LTM	POC Jerry Lanier, 912-250-0281, jerry lanier@eurofinsus com	
WBS Code	Ship to Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments
MADEPVP (A) = VPH with targets

Equipment

Code	Matrix
WG	Ground Water

Code	Container/Preservative
4	3x 40mL glass VOA Vials HCl, pH < 2 Cool < 6degC
9	1x 250mL, plastic, HNO3 pH < 2 Cool < 6degC
29	3x 40mL glass VOA Vials HCl, pH < 2, Cool < 6degC

Analytical Test Method

Event. Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023

						MADEPVP (A)	SW6010C - Mn	SW6020A - As	SW8260B - VOCs											
						4	9	9	29											
	Sample ID	Matrix	Date	Time	Samp Init.											Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	32M-01-13XBR-SPR23	WG	6/8/23	15:50	FG	X	X	X	X							32M-01-13XBR	N1	13 70	23 70		
2	32M-01-14XOB-SPR23	WG	6/9/23	10 15	FG	X	X	X	X							32M-01-14XOB	N1	17 30	27 30		
4	32M-01-17XBR-SPR23	WG				X	X	X	X							32M-01-17XBR	N1	41 40	51 40		
3	32M-01-17XBR-SPR23	WG				X	X	X	X							32M-01-17XBR	MS1	41 40	51 40		
5	32M-01-17XBR-SPR23	WG				X	X	X	X							32M-01-17XBR	SD1	41 40	51 40		
6	32M-01-18XBR-SPR23	WG	6/9/23	10:00	GS	X	X	X	X							32M-01-18XBR	N1	14 00	24 00		
7	32M-DUP01-SPR23	WG	6/9/23	10:00	GS	X	X	X	X							32M-01-18XBR	FD1	14 00	24 00		
8																					
9																					
10																					
11																					
12																					

Turnaround Time Standard

Relinquished by (Signature) Grace Shuler
Date 6/9/2023
Time 1637
Received by (Signature) 6/9/23 1637

Received by Laboratory (Signature)
Date 6/9/23
Time 1637

TA 6-10-23 932

7/6/2023

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-740983.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-236128-3
Address: 2425 New Holland Pike, ,	Due Date Requested: 6/21/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM, AOC 32/43A, Spring 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	MAVPH/5030C (MOD) MA VPH	MAVPH_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
32M-01-13XBR-SPR23 (680-236128-10)	6/8/23	15:50 Eastern		Water			X	X	3	
32M-01-14XOB-SPR23 (680-236128-11)	6/9/23	10:15 Eastern		Water			X	X	3	
32M-01-18XBR-SPR23 (680-236128-12)	6/9/23	10:00 Eastern		Water			X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6/13/23 16:00				
2						
3					6-14-23 1010	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: Raw 3.5 - COR 3.3

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236128-3

Login Number: 236128
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236128-3

Login Number: 236128
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 06/14/23 03:19 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Received extra samples not listed on COC.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 6/29/2023 3:13:28 PM Revision 1

JOB DESCRIPTION

Seres-Arcadis JV, LTM, AOC 57, Spring 2023

JOB NUMBER

680-236128-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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6/29/2023 3:13:28 PM
Revision 1

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-236128-6	57-SW1-SPR23	Water	06/09/23 12:28	06/10/23 09:32
680-236128-7	57M-95-03X-SPR23	Water	06/09/23 10:08	06/10/23 09:32
680-236128-8	57M-96-11X-SPR23	Water	06/09/23 11:37	06/10/23 09:32
680-236128-9	57M-DUP01-SPR23	Water	06/09/23 11:37	06/10/23 09:32

Job ID: 680-236128-2

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-236128-2

Receipt
The samples were received on 6/10/2023 9:32 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.7°C and 5.7°C

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Client Sample ID: 57-SW1-SPR23
Lab Sample ID: 680-236128-6
Date Collected: 06/09/23 12:28
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	4900		100	50	20	ug/L		06/28/23 12:56	1
Manganese	5800	J1	10	5.0	1.3	ug/L		06/28/23 12:56	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	6.4		5.0	3.0	0.86	ug/L		06/28/23 15:58	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Client Sample ID: 57M-95-03X-SPR23
Lab Sample ID: 680-236128-7

Date Collected: 06/09/23 10:08
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	2400		100	50	20	ug/L		06/14/23 13:48	1
Manganese	84		10	5.0	1.3	ug/L		06/14/23 13:48	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	13	J1	5.0	3.0	0.86	ug/L		06/14/23 23:41	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Client Sample ID: 57M-96-11X-SPR23
Lab Sample ID: 680-236128-8

Date Collected: 06/09/23 11:37
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	19000		100	50	20	ug/L		06/14/23 14:14	1
Manganese	3500		10	5.0	1.3	ug/L		06/14/23 14:14	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	20		5.0	3.0	0.86	ug/L		06/15/23 00:34	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Client Sample ID: 57M-DUP01-SPR23
Lab Sample ID: 680-236128-9

Date Collected: 06/09/23 11:37
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	20000		100	50	20	ug/L		06/14/23 14:16	1
Manganese	3600		10	5.0	1.3	ug/L		06/14/23 14:16	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17		5.0	3.0	0.86	ug/L		06/15/23 00:38	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-783510/1-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		06/14/23 13:44	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 13:44	1

Lab Sample ID: LCS 680-783510/2-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	5340		ug/L		107	87 - 115
Manganese	400	441		ug/L		110	90 - 114

Lab Sample ID: 680-236128-7 MS
Matrix: Water
Analysis Batch: 783688

Client Sample ID: 57M-95-03X-SPR23
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	2400		5000	7520		ug/L		103	87 - 115
Manganese	84		400	505		ug/L		105	90 - 114

Lab Sample ID: 680-236128-7 MSD
Matrix: Water
Analysis Batch: 783688

Client Sample ID: 57M-95-03X-SPR23
Prep Type: Total Recoverable
Prep Batch: 783510

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	2400		5000	7710		ug/L		107	87 - 115	2	20
Manganese	84		400	521		ug/L		109	90 - 114	3	20

Lab Sample ID: MB 680-785722/1-A
Matrix: Water
Analysis Batch: 785987

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 785722

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		06/28/23 12:46	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/28/23 12:46	1

Lab Sample ID: LCS 680-785722/2-A
Matrix: Water
Analysis Batch: 785987

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 785722

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	5310		ug/L		106	87 - 115
Manganese	400	435		ug/L		109	90 - 114

Lab Sample ID: 680-236128-6 MS
Matrix: Water
Analysis Batch: 785987

Client Sample ID: 57-SW1-SPR23
Prep Type: Dissolved
Prep Batch: 785722

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4900		4990	9640		ug/L		95	87 - 115
Manganese	5800	J1	400	5850	4	ug/L		14	90 - 114

Method: 6010C - Metals (ICP)

Lab Sample ID: 680-236128-6 MSD
Matrix: Water
Analysis Batch: 785987

Client Sample ID: 57-SW1-SPR23
Prep Type: Dissolved
Prep Batch: 785722

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	4900		4990	10200		ug/L		105	87 - 115	5	20
Manganese	5800	J1	400	6210	4	ug/L		104	90 - 114	6	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-783511/1-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 23:33	1

Lab Sample ID: LCS 680-783511/2-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	111		ug/L		111	84 - 116

Lab Sample ID: 680-236128-7 MS
Matrix: Water
Analysis Batch: 783691

Client Sample ID: 57M-95-03X-SPR23
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	13	J1	100	121		ug/L		108	84 - 116

Lab Sample ID: 680-236128-7 MSD
Matrix: Water
Analysis Batch: 783691

Client Sample ID: 57M-95-03X-SPR23
Prep Type: Total Recoverable
Prep Batch: 783511

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	13	J1	100	131	J1	ug/L		118	84 - 116	8	20

Lab Sample ID: MB 680-785723/1-A
Matrix: Water
Analysis Batch: 786071

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 785723

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/28/23 15:50	1

Lab Sample ID: LCS 680-785723/2-A
Matrix: Water
Analysis Batch: 786071

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 785723

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	109		ug/L		109	84 - 116

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-236128-6 MS
Client Sample ID: 57-SW1-SPR23
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 786071
Prep Batch: 785723

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	6.4		100	118		ug/L		111	84 - 116

Lab Sample ID: 680-236128-6 MSD
Client Sample ID: 57-SW1-SPR23
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 786071
Prep Batch: 785723

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	6.4		100	116		ug/L		110	84 - 116	2	20

Metals

Prep Batch: 783510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-7	57M-95-03X-SPR23	Total Recoverable	Water	3005A	
680-236128-8	57M-96-11X-SPR23	Total Recoverable	Water	3005A	
680-236128-9	57M-DUP01-SPR23	Total Recoverable	Water	3005A	
MB 680-783510/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783510/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236128-7 MS	57M-95-03X-SPR23	Total Recoverable	Water	3005A	
680-236128-7 MSD	57M-95-03X-SPR23	Total Recoverable	Water	3005A	

Prep Batch: 783511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-7	57M-95-03X-SPR23	Total Recoverable	Water	3005A	
680-236128-8	57M-96-11X-SPR23	Total Recoverable	Water	3005A	
680-236128-9	57M-DUP01-SPR23	Total Recoverable	Water	3005A	
MB 680-783511/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783511/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236128-7 MS	57M-95-03X-SPR23	Total Recoverable	Water	3005A	
680-236128-7 MSD	57M-95-03X-SPR23	Total Recoverable	Water	3005A	

Analysis Batch: 783688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-7	57M-95-03X-SPR23	Total Recoverable	Water	6010C	783510
680-236128-8	57M-96-11X-SPR23	Total Recoverable	Water	6010C	783510
680-236128-9	57M-DUP01-SPR23	Total Recoverable	Water	6010C	783510
MB 680-783510/1-A	Method Blank	Total Recoverable	Water	6010C	783510
LCS 680-783510/2-A	Lab Control Sample	Total Recoverable	Water	6010C	783510
680-236128-7 MS	57M-95-03X-SPR23	Total Recoverable	Water	6010C	783510
680-236128-7 MSD	57M-95-03X-SPR23	Total Recoverable	Water	6010C	783510

Analysis Batch: 783691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-7	57M-95-03X-SPR23	Total Recoverable	Water	6020A	783511
680-236128-8	57M-96-11X-SPR23	Total Recoverable	Water	6020A	783511
680-236128-9	57M-DUP01-SPR23	Total Recoverable	Water	6020A	783511
MB 680-783511/1-A	Method Blank	Total Recoverable	Water	6020A	783511
LCS 680-783511/2-A	Lab Control Sample	Total Recoverable	Water	6020A	783511
680-236128-7 MS	57M-95-03X-SPR23	Total Recoverable	Water	6020A	783511
680-236128-7 MSD	57M-95-03X-SPR23	Total Recoverable	Water	6020A	783511

Prep Batch: 785722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-6	57-SW1-SPR23	Dissolved	Water	3005A	
MB 680-785722/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-785722/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236128-6 MS	57-SW1-SPR23	Dissolved	Water	3005A	
680-236128-6 MSD	57-SW1-SPR23	Dissolved	Water	3005A	

Prep Batch: 785723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-6	57-SW1-SPR23	Dissolved	Water	3005A	
MB 680-785723/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-785723/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 785723 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-6 MS	57-SW1-SPR23	Dissolved	Water	3005A	
680-236128-6 MSD	57-SW1-SPR23	Dissolved	Water	3005A	

Analysis Batch: 785987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-6	57-SW1-SPR23	Dissolved	Water	6010C	785722
MB 680-785722/1-A	Method Blank	Total Recoverable	Water	6010C	785722
LCS 680-785722/2-A	Lab Control Sample	Total Recoverable	Water	6010C	785722
680-236128-6 MS	57-SW1-SPR23	Dissolved	Water	6010C	785722
680-236128-6 MSD	57-SW1-SPR23	Dissolved	Water	6010C	785722

Analysis Batch: 786071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236128-6	57-SW1-SPR23	Dissolved	Water	6020A	785723
MB 680-785723/1-A	Method Blank	Total Recoverable	Water	6020A	785723
LCS 680-785723/2-A	Lab Control Sample	Total Recoverable	Water	6020A	785723
680-236128-6 MS	57-SW1-SPR23	Dissolved	Water	6020A	785723
680-236128-6 MSD	57-SW1-SPR23	Dissolved	Water	6020A	785723

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Client Sample ID: 57-SW1-SPR23
Lab Sample ID: 680-236128-6
Date Collected: 06/09/23 12:28
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	785722	06/27/23 10:53	RR	EET SAV
Dissolved	Analysis	6010C		1			785987	06/28/23 12:56	BJB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	785723	06/27/23 10:53	RR	EET SAV
Dissolved	Analysis	6020A		1			786071	06/28/23 15:58	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 57M-95-03X-SPR23
Lab Sample ID: 680-236128-7
Date Collected: 06/09/23 10:08
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 13:48	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 23:41	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 57M-96-11X-SPR23
Lab Sample ID: 680-236128-8
Date Collected: 06/09/23 11:37
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:14	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:34	BWR	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 57M-DUP01-SPR23
Lab Sample ID: 680-236128-9
Date Collected: 06/09/23 11:37
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	783510	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 14:16	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783511	06/14/23 08:41	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/15/23 00:38	BWR	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:
EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236128-2
Project/Site: Seres-Arcadis JV, LTM, AOC 57, Spring 2023

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer singer@arcadis com

COC # AOC57_SPR23

Boston #215

US Army Corps of Engineers ®

Project Name. Former Fort Devens, Long Term Monitoring	Laboratory Eurofins Environment Testing TestAmerica, Savannah, GA	Event Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2023
Project Number DEVNS-LTM	POC Jerry Lanier, 912-250-0281, jerry lanier@eurofinsus com	
WBS Code.	Ship to Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments
SW6010C/FLDFLT (B) = Fe Mn
SW6020A/FLDFLT (B) = As

Equipment

Code	Matrix
WG	Ground Water
WS	Surface Water

Code	Container/Preservative
9	1x 250mL, plastic, HNO3 pH < 2, Cool < 6degC

Analytical Test Method

Event. Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2023

	Sample ID	Matrix	Date	Time	Samp Init	SW6010C - Fe Mn	SW6010C/FLDFLT (B)	SW6020A - As	SW6020A/FLDFLT (B)	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
						9	9	9	9						
1	57-SW1-SPR23	WS	6/9/23	12.28	SG		X		X	57-SW1	N1	0 00	0 00		
2	57M-95-03X-SPR23	WG	6/9/23	10.08	SG	X		X		57M-95-03X	N1	7 00	17 00		
3	57M-95-03X-SPR23	WG	6/9/23	10' 08	SG	X		X		57M-95-03X	MS1	7 00	17 00		
4	57M-95-03X-SPR23	WG	6/9/23	10.08	SG	X		X		57M-95-03X	SD1	7 00	17 00		
5	57M-96-11X-SPR23	WG	6/9/23	11:37	SG	X		X		57M-96-11X	N1	2 00	12 00		
6	57M-DUP01-SPR23	WG	6/9/23	11.37	SG	X		X		57M-96-11X	FD1	2 00	12 00		
7															
8															
9															
10															
11															

Turnaround Time Standard

TM 6.10.23
932

Relinquished by (Signature)
Date 6/9/2023
Time 16 37
Received by (Signature) 6/9/23 1637

Received by Laboratory (Signature) 6/9/23 1637
Date
Time

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236128-2

Login Number: 236128
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

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JOB DESCRIPTION

Seres-Arcadis JV, LTM, DCL, Spring 2023

JOB NUMBER

680-236120-1

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-236120-1	LFM-03-07-SPR23	Water	06/08/23 10:40	06/10/23 09:32
680-236120-2	LFM-99-02B-SPR23	Water	06/08/23 10:45	06/10/23 09:32
680-236120-3	LFM-99-05A-SPR23	Water	06/08/23 10:36	06/10/23 09:32
680-236120-4	LFM-DUP01-SPR23	Water	06/08/23 10:36	06/10/23 09:32
680-236120-5	LFM-99-06A-RP-SPR23	Water	06/08/23 13:25	06/10/23 09:32

Job ID: 680-236120-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-236120-1

Receipt
The samples were received on 6/10/2023 9:32 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 3.7°C, 4.2°C, 4.8°C and 5.5°C

Receipt Exceptions
The following samples were listed on the Chain of Custody (COC); however, no samples were received: LFM-03-07-SPR23 (680-236120-1), LFM-99-02B-SPR23 (680-236120-2), LFM-99-02B-SPR23 (680-236120-2[MS]), LFM-99-02B-SPR23 (680-236120-2[MSD]), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5).

No container received marked for 2320 analysis for sample -5

Hydrocarbons
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
Method MAEPH_DOD: C11-C22 Aromatics (unadjusted) and C11-C22 Aromatics (Adjusted) was detected above the MDL in the method blank associated with preparation batch 410-388980 and 410-391587 and analytical batch 410-391880 as well as in the following samples: LFM-03-07-SPR23 (680-236120-1), LFM-99-02B-SPR23 (680-236120-2), LFM-99-02B-SPR23 (680-236120-2[MS]), LFM-99-02B-SPR23 (680-236120-2[MSD]), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5). All affected samples were re-extracted and re-analyzed outside of holding time. Both sets of data have been reported.

Method MAEPH_DOD: For analytical batch 410-391881, the breakthrough for naphthalene and 2-methylnaphthalene in the LCS and LCSD is <1%. The method requirement for breakthrough is <5%. LFM-03-07-SPR23 (680-236120-1), LFM-99-02B-SPR23 (680-236120-2), LFM-99-02B-SPR23 (680-236120-2[MS]), LFM-99-02B-SPR23 (680-236120-2[MSD]), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5)

Method MAEPH_DOD: Surrogate recovery was outside acceptance limits for the following matrix spike/matrix spike duplicate (MS/MSD) sample: LFM-99-02B-SPR23 (680-236120-2[MS]). The parent sample's surrogate recovery was within limits. The MS/MSD sample has been qualified and reported.

Method MAEPH_DOD: Breakthrough requirements were not met for analytical batch 410-394765. The breakthrough for naphthalene is <1% and the breakthrough for 2-methylnaphthalene is 1% in the LCS. The breakthrough for naphthalene is 6% and the breakthrough for 2-methylnaphthalene is 2% in the LCSD. The method requirement for breakthrough is <5%. LFM-03-07-SPR23 (680-236120-1), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5)

Method MAEPH_DOD: The laboratory control sample (LCS) for preparation batch 410-388980 and 410-391587 and analytical batch 410-391881 recovered outside control limits for the following analytes: C9-C18 Aliphatics. The associated sample(s) was re-prepared and/or re-analyzed outside holding time. Both sets of data have been reported. LFM-03-07-SPR23 (680-236120-1), LFM-99-02B-SPR23 (680-236120-2), LFM-99-02B-SPR23 (680-236120-2[MS]), LFM-99-02B-SPR23 (680-236120-2[MSD]), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5)

Method MAEPH_DOD: The following sample(s) was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: LFM-03-07-SPR23 (680-236120-1), LFM-99-02B-SPR23 (680-236120-2), LFM-99-02B-SPR23 (680-236120-2[MS]), LFM-99-02B-SPR23 (680-236120-2[MSD]), LFM-99-05A-SPR23 (680-236120-3), LFM-DUP01-SPR23 (680-236120-4) and LFM-99-06A-RP-SPR23 (680-236120-5).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 680-236120-1 (Continued)

Laboratory: Eurofins Savannah (Continued)

Pesticides/PCBs

Method 8081B_8082A_D5: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 680-783438 and analytical batch 680-783593 recovered outside control limits for the following analyte: Chlordane (technical).

Method 8081B_8082A_D5: The laboratory control sample duplicate (LCSD) for preparation batch 680-783438 and analytical batch 680-783593 recovered outside control limits for the following analyte: Chlordane (technical). Re-extraction would have been outside of holding time. The LCS was within recovery limits for the affected analyte.

Method 8081B_8082A_D5: The laboratory control sample (LCS) associated with preparation batch 680-783438 and analytical batch 680-783593 was outside acceptance criteria. Re-extraction could not be performed within holding time; therefore, the data have been reported. The batch matrix spike/matrix spike duplicate (MS/MSD) was within acceptance limits and may be used to evaluate matrix performance.

Method 8081B_8082A_D5: The following analytes have been identified, in the reference method and/or via historical data, to be poor and/or erratic performers: <AffectedAnalytes>

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample ID: LFM-03-07-SPR23
Lab Sample ID: 680-236120-1
Date Collected: 06/08/23 10:40
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 16:24	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 16:24	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 16:24	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 16:24	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 16:24	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 16:24	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 16:24	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 16:24	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 16:24	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 16:24*	*1*
a,a,a-Trifluorotoluene (pid)	*98*		*70 - 130*		*06/21/23 16:24*	*1*

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0039	U M Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
4,4'-DDE	0.0039	U M Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
4,4'-DDT	0.0039	U Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
Aldrin	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
alpha-BHC	0.0039	U Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
beta-BHC	0.0039	U	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
delta-BHC	0.0039	U	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Dieldrin	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Endosulfan I	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Endosulfan II	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Endosulfan sulfate	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Endrin	0.0039	U M Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
Endrin aldehyde	0.016	U Q	0.048	0.016	0.0039	ug/L		06/21/23 17:06	1
Endrin ketone	0.016	U Q	0.048	0.016	0.0039	ug/L		06/21/23 17:06	1
gamma-BHC (Lindane)	0.0039	U Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
Heptachlor	0.0039	U Q	0.048	0.0039	0.00097	ug/L		06/21/23 17:06	1
Heptachlor epoxide	0.0039	U Q	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Methoxychlor	0.0039	U	0.048	0.0039	0.0019	ug/L		06/21/23 17:06	1
Chlordane (technical)	0.39	U M Q	0.48	0.39	0.16	ug/L		06/21/23 17:06	1
Toxaphene	0.78	U	4.8	0.78	0.30	ug/L		06/21/23 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*113*		*14 - 130*	*06/13/23 17:04*	*06/21/23 17:06*	*1*
Tetrachloro-m-xylene	*87*		*44 - 124*	*06/13/23 17:04*	*06/21/23 17:06*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Pyrene	9.7	U H	12	9.7	4.9	ug/L		06/29/23 00:57	1
Benzo[g,h,i]perylene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Benzo[b]fluoranthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Fluoranthene	0.97	U H	1.9	0.97	0.49	ug/L		06/29/23 00:57	1

Client Sample ID: LFM-03-07-SPR23
Lab Sample ID: 680-236120-1
Date Collected: 06/08/23 10:40
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[k]fluoranthene	2.9	U H	3.9	2.9	1.5	ug/L		06/29/23 00:57	1
Acenaphthylene	1.4	U H Q	1.9	1.4	0.68	ug/L		06/29/23 00:57	1
Chrysene	0.97	U H	1.9	0.97	0.49	ug/L		06/29/23 00:57	1
Benzo[a]pyrene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Dibenz(a,h)anthracene	0.97	U H	1.9	0.97	0.49	ug/L		06/29/23 00:57	1
Benzo[a]anthracene	1.4	U H	1.9	1.4	0.68	ug/L		06/29/23 00:57	1
Acenaphthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Phenanthrene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Fluorene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
Naphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
2-Methylnaphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 00:57	1
C11-C22 Aromatics (Adjusted)	29	U H	39	29	9.7	ug/L		06/29/23 00:57	1
C19-C36 Aliphatics	19	U H M Q	49	19	9.7	ug/L		06/29/23 00:34	1
C9-C18 Aliphatics	58	U H Q	88	58	29	ug/L		06/29/23 00:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*65*	*M*	*40 - 140*	*06/21/23 08:13*	*06/29/23 00:34*	*1*
2-Fluorobiphenyl (Surr)	*83*		*40 - 140*	*06/21/23 08:13*	*06/29/23 00:57*	*1*
o- terphenyl (Surr)	*75*		*40 - 140*	*06/21/23 08:13*	*06/29/23 00:57*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Pyrene	9.5	U H Q	11	9.5	4.7	ug/L		07/08/23 00:06	1
Benzo[g,h,i]perylene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Indeno[1,2,3-cd]pyrene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Benzo[b]fluoranthene	1.1	U H	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Fluoranthene	0.95	U H Q	1.9	0.95	0.47	ug/L		07/08/23 00:06	1
Benzo[k]fluoranthene	2.8	U H Q	3.8	2.8	1.4	ug/L		07/08/23 00:06	1
Acenaphthylene	1.3	U H Q	1.9	1.3	0.66	ug/L		07/08/23 00:06	1
Chrysene	0.95	U H Q	1.9	0.95	0.47	ug/L		07/08/23 00:06	1
Benzo[a]pyrene	1.1	U H	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Dibenz(a,h)anthracene	0.95	U H	1.9	0.95	0.47	ug/L		07/08/23 00:06	1
Benzo[a]anthracene	1.3	U H	1.9	1.3	0.66	ug/L		07/08/23 00:06	1
Acenaphthene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Phenanthrene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Fluorene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
Naphthalene	1.1	U H M Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
2-Methylnaphthalene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 00:06	1
C11-C22 Aromatics (Adjusted)	28	U H	38	28	9.5	ug/L		07/08/23 00:06	1
C19-C36 Aliphatics	19	U H	47	19	9.5	ug/L		07/08/23 00:06	1
C9-C18 Aliphatics	57	U H	85	57	28	ug/L		07/08/23 00:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*71*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:06*	*1*
2-Fluorobiphenyl (Surr)	*66*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:06*	*1*
o- terphenyl (Surr)	*57*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:06*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-03-07-SPR23
Lab Sample ID: 680-236120-1
Date Collected: 06/08/23 10:40
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfate	**33**	**M**	1.0	1.0	0.40	mg/L		06/16/23 19:48	1

Method: SW846 9056A - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**260**	**D**	2.5	2.5	1.0	mg/L		06/17/23 16:13	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**16**	**J**	20	10	4.4	ug/L		06/12/23 13:17	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/12/23 13:17	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/12/23 13:17	1
Copper	10	U	20	10	3.2	ug/L		06/12/23 13:17	1
Iron	50	U	100	50	20	ug/L		06/12/23 13:17	1
Lead	20	U	40	20	6.6	ug/L		06/12/23 13:17	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/12/23 13:17	1
Selenium	20	U	25	20	10	ug/L		06/12/23 13:17	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/12/23 13:17	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/12/23 13:32	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:24	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	**98**		5.0	5.0	2.2	mg/L		06/14/23 02:20	1
Total Dissolved Solids (SM 2540C-2011)	**620**		24	20	24	mg/L		06/13/23 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	**1.0**		0.10	0.025	0.010	mg/L		06/22/23 17:19	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		06/15/23 11:42	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:15	1

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-02B-SPR23
Lab Sample ID: 680-236120-2
Date Collected: 06/08/23 10:45
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 17:05	1
C9-C10 Aromatics	20	U J1	100	20	10	ug/L		06/21/23 17:05	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 17:05	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 17:05	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 17:05	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 17:05	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 17:05	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 17:05	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 17:05	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*100*		*70 - 130*		*06/21/23 17:05*	*1*
a,a,a-Trifluorotoluene (pid)	*98*		*70 - 130*		*06/21/23 17:05*	*1*

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
4,4'-DDE	0.0039	U M Q	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
4,4'-DDT	0.0039	U M	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
Aldrin	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
alpha-BHC	0.0039	U Q	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
beta-BHC	0.0039	U M	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
delta-BHC	0.0039	U J1	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Dieldrin	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Endosulfan I	0.0039	U J1 Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Endosulfan II	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Endosulfan sulfate	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Endrin	0.0039	U Q	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
Endrin aldehyde	0.016	U Q	0.049	0.016	0.0039	ug/L		06/14/23 21:12	1
Endrin ketone	0.016	U Q	0.049	0.016	0.0039	ug/L		06/14/23 21:12	1
gamma-BHC (Lindane)	0.0039	U Q	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
Heptachlor	0.0039	U Q	0.049	0.0039	0.00098	ug/L		06/14/23 21:12	1
Heptachlor epoxide	0.0039	U Q	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Methoxychlor	0.0039	U	0.049	0.0039	0.0020	ug/L		06/14/23 21:12	1
Chlordane (technical)	0.39	U M Q	0.49	0.39	0.16	ug/L		06/14/23 21:12	1
Toxaphene	0.78	U	4.9	0.78	0.30	ug/L		06/14/23 21:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*87*		*14 - 130*	*06/13/23 17:04*	*06/14/23 21:12*	*1*
Tetrachloro-m-xylene	*72*		*44 - 124*	*06/13/23 17:04*	*06/14/23 21:12*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Pyrene	9.7	U H	12	9.7	4.8	ug/L		06/29/23 01:20	1
Benzo[g,h,i]perylene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Benzo[b]fluoranthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Fluoranthene	0.97	U H	1.9	0.97	0.48	ug/L		06/29/23 01:20	1

Client Sample ID: LFM-99-02B-SPR23
Lab Sample ID: 680-236120-2
Date Collected: 06/08/23 10:45
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[k]fluoranthene	2.9	U H	3.9	2.9	1.4	ug/L		06/29/23 01:20	1
Acenaphthylene	1.4	U H Q	1.9	1.4	0.68	ug/L		06/29/23 01:20	1
Chrysene	0.97	U H	1.9	0.97	0.48	ug/L		06/29/23 01:20	1
Benzo[a]pyrene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Dibenz(a,h)anthracene	0.97	U H	1.9	0.97	0.48	ug/L		06/29/23 01:20	1
Benzo[a]anthracene	1.4	U H	1.9	1.4	0.68	ug/L		06/29/23 01:20	1
Acenaphthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Phenanthrene	**0.93**	**J H Q**	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Fluorene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
Naphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
2-Methylnaphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 01:20	1
C11-C22 Aromatics (Adjusted)	**17**	**J H**	39	29	9.7	ug/L		06/29/23 01:20	1
C19-C36 Aliphatics	19	U H M Q	48	19	9.7	ug/L		06/29/23 00:57	1
C9-C18 Aliphatics	58	U H Q	87	58	29	ug/L		06/29/23 00:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*63*	*M*	*40 - 140*	*06/21/23 08:13*	*06/29/23 00:57*	*1*
2-Fluorobiphenyl (Surr)	*91*		*40 - 140*	*06/21/23 08:13*	*06/29/23 01:20*	*1*
o- terphenyl (Surr)	*83*		*40 - 140*	*06/21/23 08:13*	*06/29/23 01:20*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Pyrene	9.6	U H Q	12	9.6	4.8	ug/L		07/08/23 00:28	1
Benzo[g,h,i]perylene	1.2	U H Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Indeno[1,2,3-cd]pyrene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Benzo[b]fluoranthene	1.2	U H	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Fluoranthene	0.96	U H J1 Q	1.9	0.96	0.48	ug/L		07/08/23 00:28	1
Benzo[k]fluoranthene	2.9	U H Q	3.8	2.9	1.4	ug/L		07/08/23 00:28	1
Acenaphthylene	1.3	U H J1 Q	1.9	1.3	0.67	ug/L		07/08/23 00:28	1
Chrysene	0.96	U H Q	1.9	0.96	0.48	ug/L		07/08/23 00:28	1
Benzo[a]pyrene	1.2	U H J1	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Dibenz(a,h)anthracene	0.96	U H	1.9	0.96	0.48	ug/L		07/08/23 00:28	1
Benzo[a]anthracene	1.3	U H J1	1.9	1.3	0.67	ug/L		07/08/23 00:28	1
Acenaphthene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Phenanthrene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Fluorene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
Naphthalene	1.2	U H M J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
2-Methylnaphthalene	1.2	U H J1 Q	1.9	1.2	0.58	ug/L		07/08/23 00:28	1
C11-C22 Aromatics (Adjusted)	29	U H	38	29	9.6	ug/L		07/08/23 00:28	1
C19-C36 Aliphatics	19	U H	48	19	9.6	ug/L		07/08/23 00:28	1
C9-C18 Aliphatics	58	U H M	86	58	29	ug/L		07/08/23 00:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*77*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:28*	*1*
2-Fluorobiphenyl (Surr)	*75*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:28*	*1*
o- terphenyl (Surr)	*65*		*40 - 140*	*06/30/23 14:30*	*07/08/23 00:28*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-02B-SPR23
Lab Sample ID: 680-236120-2
Date Collected: 06/08/23 10:45
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**250**	**D**	2.5	2.5	1.0	mg/L		06/17/23 11:47	5
Sulfate	**14**	**D M**	5.0	5.0	2.0	mg/L		06/17/23 11:47	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**9.1**	**J**	20	10	4.4	ug/L		06/12/23 12:56	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/12/23 12:56	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/12/23 12:56	1
Copper	10	U	20	10	3.2	ug/L		06/12/23 12:56	1
Iron	50	U	100	50	20	ug/L		06/12/23 12:56	1
Lead	20	U	40	20	6.6	ug/L		06/12/23 12:56	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/12/23 12:56	1
Selenium	20	U	25	20	10	ug/L		06/12/23 12:56	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/12/23 12:56	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/12/23 12:19	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:26	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	**81**		5.0	5.0	2.2	mg/L		06/14/23 02:11	1
Total Dissolved Solids (SM 2540C-2011)	**490**		24	20	24	mg/L		06/13/23 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	**0.26**		0.10	0.025	0.010	mg/L		06/22/23 17:13	1
Chemical Oxygen Demand (EPA 410.4)	20	U J1	20	20	8.7	mg/L		06/20/23 12:11	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:15	1

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-05A-SPR23
Lab Sample ID: 680-236120-3
Date Collected: 06/08/23 10:36
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:08	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 19:08	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:08	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:08	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 19:08	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:08	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 19:08	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 19:08	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:08	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 19:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*102*		*70 - 130*		*06/21/23 19:08*	*1*
a,a,a-Trifluorotoluene (pid)	*99*		*70 - 130*		*06/21/23 19:08*	*1*

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0042	U M Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
4,4'-DDE	0.0042	U M Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
4,4'-DDT	0.0042	U Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
Aldrin	0.0042	U Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
alpha-BHC	0.0042	U Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
beta-BHC	**0.0097**	**J**	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
delta-BHC	0.0042	U	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Dieldrin	0.0042	U Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Endosulfan I	0.0042	U Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Endosulfan II	0.0042	U M Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Endosulfan sulfate	0.0042	U Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Endrin	0.0042	U Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
Endrin aldehyde	0.017	U Q	0.052	0.017	0.0042	ug/L		06/21/23 17:21	1
Endrin ketone	0.017	U Q	0.052	0.017	0.0042	ug/L		06/21/23 17:21	1
gamma-BHC (Lindane)	0.0042	U Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
Heptachlor	0.0042	U Q	0.052	0.0042	0.0010	ug/L		06/21/23 17:21	1
Heptachlor epoxide	0.0042	U Q	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Methoxychlor	0.0042	U	0.052	0.0042	0.0021	ug/L		06/21/23 17:21	1
Chlordane (technical)	0.42	U M Q	0.52	0.42	0.17	ug/L		06/21/23 17:21	1
Toxaphene	0.84	U	5.2	0.84	0.32	ug/L		06/21/23 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*111*		*14 - 130*	*06/13/23 17:04*	*06/21/23 17:21*	*1*
Tetrachloro-m-xylene	*69*		*44 - 124*	*06/13/23 17:04*	*06/21/23 17:21*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Pyrene	10	U H	12	10	5.1	ug/L		06/29/23 02:27	1
Benzo[g,h,i]perylene	1.2	U H	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Benzo[b]fluoranthene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Fluoranthene	1.0	U H	2.1	1.0	0.51	ug/L		06/29/23 02:27	1

Client Sample ID: LFM-99-05A-SPR23
Lab Sample ID: 680-236120-3
Date Collected: 06/08/23 10:36
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[k]fluoranthene	3.1	U H	4.1	3.1	1.5	ug/L		06/29/23 02:27	1
Acenaphthylene	1.4	U H Q	2.1	1.4	0.72	ug/L		06/29/23 02:27	1
Chrysene	1.0	U H	2.1	1.0	0.51	ug/L		06/29/23 02:27	1
Benzo[a]pyrene	1.2	U H	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Dibenz(a,h)anthracene	1.0	U H	2.1	1.0	0.51	ug/L		06/29/23 02:27	1
Benzo[a]anthracene	1.4	U H	2.1	1.4	0.72	ug/L		06/29/23 02:27	1
Acenaphthene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Phenanthrene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Fluorene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
Naphthalene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
2-Methylnaphthalene	1.2	U H Q	2.1	1.2	0.62	ug/L		06/29/23 02:27	1
C11-C22 Aromatics (Adjusted)	31	U H	41	31	10	ug/L		06/29/23 02:27	1
C19-C36 Aliphatics	21	U H Q	51	21	10	ug/L		06/29/23 02:05	1
C9-C18 Aliphatics	62	U H Q	93	62	31	ug/L		06/29/23 02:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*56*		*40 - 140*	*06/21/23 08:13*	*06/29/23 02:05*	*1*
2-Fluorobiphenyl (Surr)	*61*		*40 - 140*	*06/21/23 08:13*	*06/29/23 02:27*	*1*
o- terphenyl (Surr)	*47*		*40 - 140*	*06/21/23 08:13*	*06/29/23 02:27*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Pyrene	10	U H Q	12	10	5.0	ug/L		07/08/23 01:35	1
Benzo[g,h,i]perylene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Benzo[b]fluoranthene	1.2	U H	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Fluoranthene	1.0	U H Q	2.0	1.0	0.50	ug/L		07/08/23 01:35	1
Benzo[k]fluoranthene	3.0	U H Q	4.0	3.0	1.5	ug/L		07/08/23 01:35	1
Acenaphthylene	1.4	U H Q	2.0	1.4	0.70	ug/L		07/08/23 01:35	1
Chrysene	1.0	U H Q	2.0	1.0	0.50	ug/L		07/08/23 01:35	1
Benzo[a]pyrene	1.2	U H	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Dibenz(a,h)anthracene	1.0	U H	2.0	1.0	0.50	ug/L		07/08/23 01:35	1
Benzo[a]anthracene	1.4	U H	2.0	1.4	0.70	ug/L		07/08/23 01:35	1
Acenaphthene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Phenanthrene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Fluorene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
Naphthalene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
2-Methylnaphthalene	1.2	U H Q	2.0	1.2	0.60	ug/L		07/08/23 01:35	1
C11-C22 Aromatics (Adjusted)	30	U H	40	30	10	ug/L		07/08/23 01:35	1
C19-C36 Aliphatics	20	U H	50	20	10	ug/L		07/08/23 01:35	1
C9-C18 Aliphatics	60	U H M	90	60	30	ug/L		07/08/23 01:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*78*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:35*	*1*
2-Fluorobiphenyl (Surr)	*76*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:35*	*1*
o- terphenyl (Surr)	*67*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:35*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-05A-SPR23
Lab Sample ID: 680-236120-3
Date Collected: 06/08/23 10:36
Matrix: Water
Date Received: 06/10/23 09:32

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**170**	**D**	1.0	1.0	0.40	mg/L		06/17/23 12:38	2
Sulfate	**16**	**D**	2.0	2.0	0.80	mg/L		06/17/23 12:38	2

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**15**	**J**	20	10	4.4	ug/L		06/14/23 16:27	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/14/23 16:27	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/14/23 16:27	1
Copper	10	U	20	10	3.2	ug/L		06/14/23 16:27	1
Iron	50	U	100	50	20	ug/L		06/14/23 16:27	1
Lead	20	U	40	20	6.6	ug/L		06/14/23 16:27	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 16:27	1
Selenium	20	U	25	20	10	ug/L		06/14/23 16:27	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/14/23 16:27	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 18:17	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	**98**		5.0	5.0	2.2	mg/L		06/14/23 02:30	1
Total Dissolved Solids (SM 2540C-2011)	**430**		24	20	24	mg/L		06/13/23 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	**0.41**		0.10	0.025	0.010	mg/L		06/22/23 17:21	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		06/15/23 11:42	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:15	1

Client Sample ID: LFM-DUP01-SPR23
Lab Sample ID: 680-236120-4
Date Collected: 06/08/23 10:36
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:49	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 19:49	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:49	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:49	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 19:49	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:49	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 19:49	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 19:49	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 19:49	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 19:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*100*		*70 - 130*		*06/21/23 19:49*	*1*
a,a,a-Trifluorotoluene (pid)	*98*		*70 - 130*		*06/21/23 19:49*	*1*

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
4,4'-DDE	0.0043	U M Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
4,4'-DDT	0.0043	U Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
Aldrin	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
alpha-BHC	0.0043	U Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
beta-BHC	0.0043	U	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
delta-BHC	0.0043	U	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Dieldrin	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Endosulfan I	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Endosulfan II	0.0043	U M Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Endosulfan sulfate	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Endrin	0.0043	U Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
Endrin aldehyde	0.017	U Q	0.053	0.017	0.0043	ug/L		06/21/23 17:35	1
Endrin ketone	0.017	U Q	0.053	0.017	0.0043	ug/L		06/21/23 17:35	1
gamma-BHC (Lindane)	0.0043	U Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
Heptachlor	0.0043	U Q	0.053	0.0043	0.0011	ug/L		06/21/23 17:35	1
Heptachlor epoxide	0.0043	U Q	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Methoxychlor	0.0043	U	0.053	0.0043	0.0021	ug/L		06/21/23 17:35	1
Chlordane (technical)	0.43	U M Q	0.53	0.43	0.17	ug/L		06/21/23 17:35	1
Toxaphene	0.85	U	5.3	0.85	0.33	ug/L		06/21/23 17:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*100*		*14 - 130*	*06/13/23 17:04*	*06/21/23 17:35*	*1*
Tetrachloro-m-xylene	*83*		*44 - 124*	*06/13/23 17:04*	*06/21/23 17:35*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Pyrene	9.6	U H	12	9.6	4.8	ug/L		06/29/23 02:50	1
Benzo[g,h,i]perylene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Benzo[b]fluoranthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Fluoranthene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 02:50	1

Client Sample ID: LFM-DUP01-SPR23
Lab Sample ID: 680-236120-4
Date Collected: 06/08/23 10:36
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[k]fluoranthene	2.9	U H	3.9	2.9	1.4	ug/L		06/29/23 02:50	1
Acenaphthylene	1.3	U H Q	1.9	1.3	0.67	ug/L		06/29/23 02:50	1
Chrysene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 02:50	1
Benzo[a]pyrene	1.2	U H	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Dibenz(a,h)anthracene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 02:50	1
Benzo[a]anthracene	1.3	U H	1.9	1.3	0.67	ug/L		06/29/23 02:50	1
Acenaphthene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Phenanthrene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Fluorene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
Naphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
2-Methylnaphthalene	1.2	U H Q	1.9	1.2	0.58	ug/L		06/29/23 02:50	1
C11-C22 Aromatics (Adjusted)	29	U H	39	29	9.6	ug/L		06/29/23 02:50	1
C19-C36 Aliphatics	19	U H M Q	48	19	9.6	ug/L		06/29/23 02:27	1
C9-C18 Aliphatics	58	U H Q	87	58	29	ug/L		06/29/23 02:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*68*	*M*	*40 - 140*	*06/21/23 08:13*	*06/29/23 02:27*	*1*
2-Fluorobiphenyl (Surr)	*74*		*40 - 140*	*06/21/23 08:13*	*06/29/23 02:50*	*1*
o- terphenyl (Surr)	*67*		*40 - 140*	*06/21/23 08:13*	*06/29/23 02:50*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Pyrene	9.9	U H Q	12	9.9	5.0	ug/L		07/08/23 01:57	1
Benzo[g,h,i]perylene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Indeno[1,2,3-cd]pyrene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Benzo[b]fluoranthene	1.2	U H	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Fluoranthene	0.99	U H Q	2.0	0.99	0.50	ug/L		07/08/23 01:57	1
Benzo[k]fluoranthene	3.0	U H Q	4.0	3.0	1.5	ug/L		07/08/23 01:57	1
Acenaphthylene	1.4	U H Q	2.0	1.4	0.69	ug/L		07/08/23 01:57	1
Chrysene	0.99	U H Q	2.0	0.99	0.50	ug/L		07/08/23 01:57	1
Benzo[a]pyrene	1.2	U H	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Dibenz(a,h)anthracene	0.99	U H	2.0	0.99	0.50	ug/L		07/08/23 01:57	1
Benzo[a]anthracene	1.4	U H	2.0	1.4	0.69	ug/L		07/08/23 01:57	1
Acenaphthene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Phenanthrene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Fluorene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
Naphthalene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
2-Methylnaphthalene	1.2	U H Q	2.0	1.2	0.59	ug/L		07/08/23 01:57	1
C11-C22 Aromatics (Adjusted)	30	U H	40	30	9.9	ug/L		07/08/23 01:57	1
C19-C36 Aliphatics	20	U H	50	20	9.9	ug/L		07/08/23 01:57	1
C9-C18 Aliphatics	59	U H	89	59	30	ug/L		07/08/23 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*72*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:57*	*1*
2-Fluorobiphenyl (Surr)	*73*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:57*	*1*
o- terphenyl (Surr)	*67*		*40 - 140*	*06/30/23 14:30*	*07/08/23 01:57*	*1*

Client Sample ID: LFM-DUP01-SPR23

Lab Sample ID: 680-236120-4

Date Collected: 06/08/23 10:36

Matrix: Water

Date Received: 06/10/23 09:32

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**180**	**D**	1.0	1.0	0.40	mg/L		06/17/23 12:50	2
Sulfate	**17**	**D M**	2.0	2.0	0.80	mg/L		06/17/23 12:50	2

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**14**	**J**	20	10	4.4	ug/L		06/14/23 16:37	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/14/23 16:37	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/14/23 16:37	1
Copper	10	U	20	10	3.2	ug/L		06/14/23 16:37	1
Iron	50	U	100	50	20	ug/L		06/14/23 16:37	1
Lead	20	U	40	20	6.6	ug/L		06/14/23 16:37	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 16:37	1
Selenium	20	U	25	20	10	ug/L		06/14/23 16:37	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/14/23 16:37	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 18:21	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:32	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	**98**		5.0	5.0	2.2	mg/L		06/16/23 17:38	1
Total Dissolved Solids (SM 2540C-2011)	**440**		24	20	24	mg/L		06/13/23 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	**0.41**		0.10	0.025	0.010	mg/L		06/22/23 17:22	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		06/15/23 11:42	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:15	1

Client Sample ID: LFM-99-06A-RP-SPR23
Lab Sample ID: 680-236120-5
Date Collected: 06/08/23 13:25
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 20:30	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 20:30	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 20:30	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 20:30	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 20:30	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 20:30	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 20:30	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 20:30	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 20:30	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 20:30*	*1*
a,a,a-Trifluorotoluene (pid)	*99*		*70 - 130*		*06/21/23 20:30*	*1*

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0038	U M Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
4,4'-DDE	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
4,4'-DDT	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
Aldrin	0.0038	U Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
alpha-BHC	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
beta-BHC	0.0038	U	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
delta-BHC	0.0038	U	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Dieldrin	0.0038	U Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Endosulfan I	0.0038	U Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Endosulfan II	0.0038	U M Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Endosulfan sulfate	0.0038	U Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Endrin	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
Endrin aldehyde	0.015	U M Q	0.048	0.015	0.0038	ug/L		06/21/23 17:50	1
Endrin ketone	0.015	U Q	0.048	0.015	0.0038	ug/L		06/21/23 17:50	1
gamma-BHC (Lindane)	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
Heptachlor	0.0038	U Q	0.048	0.0038	0.00096	ug/L		06/21/23 17:50	1
Heptachlor epoxide	0.0038	U Q	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Methoxychlor	0.0038	U	0.048	0.0038	0.0019	ug/L		06/21/23 17:50	1
Chlordane (technical)	0.38	U M Q	0.48	0.38	0.15	ug/L		06/21/23 17:50	1
Toxaphene	0.77	U	4.8	0.77	0.30	ug/L		06/21/23 17:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*84*		*14 - 130*	*06/13/23 17:04*	*06/21/23 17:50*	*1*
Tetrachloro-m-xylene	*69*		*44 - 124*	*06/13/23 17:04*	*06/21/23 17:50*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Pyrene	9.6	U H	11	9.6	4.8	ug/L		06/29/23 03:12	1
Benzo[g,h,i]perylene	1.1	U H	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Indeno[1,2,3-cd]pyrene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Benzo[b]fluoranthene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Fluoranthene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 03:12	1

Client Sample ID: LFM-99-06A-RP-SPR23
Lab Sample ID: 680-236120-5
Date Collected: 06/08/23 13:25
Matrix: Water
Date Received: 06/10/23 09:32

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[k]fluoranthene	2.9	U H	3.8	2.9	1.4	ug/L		06/29/23 03:12	1
Acenaphthylene	1.3	U H Q	1.9	1.3	0.67	ug/L		06/29/23 03:12	1
Chrysene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 03:12	1
Benzo[a]pyrene	1.1	U H	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Dibenz(a,h)anthracene	0.96	U H	1.9	0.96	0.48	ug/L		06/29/23 03:12	1
Benzo[a]anthracene	1.3	U H	1.9	1.3	0.67	ug/L		06/29/23 03:12	1
Acenaphthene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Phenanthrene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Fluorene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
Naphthalene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
2-Methylnaphthalene	1.1	U H Q	1.9	1.1	0.57	ug/L		06/29/23 03:12	1
C11-C22 Aromatics (Adjusted)	29	U H	38	29	9.6	ug/L		06/29/23 03:12	1
C19-C36 Aliphatics	19	U H M Q	48	19	9.6	ug/L		06/29/23 02:50	1
C9-C18 Aliphatics	57	U H Q	86	57	29	ug/L		06/29/23 02:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*68*	*M*	*40 - 140*	*06/21/23 08:13*	*06/29/23 02:50*	*1*
2-Fluorobiphenyl (Surr)	*79*		*40 - 140*	*06/21/23 08:13*	*06/29/23 03:12*	*1*
o- terphenyl (Surr)	*74*		*40 - 140*	*06/21/23 08:13*	*06/29/23 03:12*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Pyrene	9.5	U H Q	11	9.5	4.8	ug/L		07/08/23 02:20	1
Benzo[g,h,i]perylene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Indeno[1,2,3-cd]pyrene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Benzo[b]fluoranthene	1.1	U H	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Fluoranthene	0.95	U H Q	1.9	0.95	0.48	ug/L		07/08/23 02:20	1
Benzo[k]fluoranthene	2.9	U H Q	3.8	2.9	1.4	ug/L		07/08/23 02:20	1
Acenaphthylene	1.3	U H Q	1.9	1.3	0.67	ug/L		07/08/23 02:20	1
Chrysene	0.95	U H Q	1.9	0.95	0.48	ug/L		07/08/23 02:20	1
Benzo[a]pyrene	1.1	U H	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Dibenz(a,h)anthracene	0.95	U H	1.9	0.95	0.48	ug/L		07/08/23 02:20	1
Benzo[a]anthracene	1.3	U H	1.9	1.3	0.67	ug/L		07/08/23 02:20	1
Acenaphthene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Phenanthrene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Fluorene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
Naphthalene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
2-Methylnaphthalene	1.1	U H Q	1.9	1.1	0.57	ug/L		07/08/23 02:20	1
C11-C22 Aromatics (Adjusted)	29	U H	38	29	9.5	ug/L		07/08/23 02:20	1
C19-C36 Aliphatics	19	U H	48	19	9.5	ug/L		07/08/23 02:20	1
C9-C18 Aliphatics	57	U H M	86	57	29	ug/L		07/08/23 02:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*68*		*40 - 140*	*06/30/23 14:30*	*07/08/23 02:20*	*1*
2-Fluorobiphenyl (Surr)	*70*		*40 - 140*	*06/30/23 14:30*	*07/08/23 02:20*	*1*
o- terphenyl (Surr)	*66*		*40 - 140*	*06/30/23 14:30*	*07/08/23 02:20*	*1*

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Job ID: 680-236120-1

Client Sample ID: LFM-99-06A-RP-SPR23

Lab Sample ID: 680-236120-5

Date Collected: 06/08/23 13:25

Matrix: Water

Date Received: 06/10/23 09:32

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**310**	**D**	2.5	2.5	1.0	mg/L		06/17/23 13:03	5
Sulfate	**30**	**D M**	5.0	5.0	2.0	mg/L		06/17/23 13:03	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**6.9**	**J**	20	10	4.4	ug/L		06/14/23 16:39	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/14/23 16:39	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/14/23 16:39	1
Copper	10	U	20	10	3.2	ug/L		06/14/23 16:39	1
Iron	50	U	100	50	20	ug/L		06/14/23 16:39	1
Lead	20	U	40	20	6.6	ug/L		06/14/23 16:39	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 16:39	1
Selenium	20	U	25	20	10	ug/L		06/14/23 16:39	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/14/23 16:39	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 18:25	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:33	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	**92**		5.0	5.0	2.2	mg/L		06/17/23 01:45	1
Total Dissolved Solids (SM 2540C-2011)	**670**		24	20	24	mg/L		06/13/23 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	**0.77**		0.10	0.025	0.010	mg/L		06/22/23 17:24	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		06/15/23 11:42	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:15	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-389210/2
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C9-C10 Aromatics	20	U	100	20	10	ug/L		06/21/23 14:21	1
Ethylbenzene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
Naphthalene	4.0	U	6.0	4.0	2.0	ug/L		06/21/23 14:21	1
Toluene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C9-C12 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 14:21	1
m-Xylene & p-Xylene	5.0	U	10	5.0	2.5	ug/L		06/21/23 14:21	1
o-Xylene	2.0	U	5.0	2.0	1.0	ug/L		06/21/23 14:21	1
C5-C8 Aliphatics (adjusted)	50	U	100	50	25	ug/L		06/21/23 14:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*		*06/21/23 14:21*	*1*
a,a,a-Trifluorotoluene (pid)	*97*		*70 - 130*		*06/21/23 14:21*	*1*

Lab Sample ID: LCS 410-389210/3
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	50.1	47.6		ug/L		95	70 - 130
C9-C10 Aromatics	50.2	50.1	J	ug/L		100	70 - 130
Ethylbenzene	50.1	48.9		ug/L		98	70 - 130
Methyl tert-butyl ether	50.2	45.9		ug/L		92	70 - 130
Naphthalene	50.2	52.1		ug/L		104	70 - 130
Toluene	50.1	48.0		ug/L		96	70 - 130
m-Xylene & p-Xylene	101	100		ug/L		99	70 - 130
o-Xylene	50.4	49.4		ug/L		98	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*101*		*70 - 130*

Lab Sample ID: LCSD 410-389210/4
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	50.1	47.9		ug/L		96	70 - 130	1	25
C9-C10 Aromatics	50.2	49.7	J	ug/L		99	70 - 130	1	25
Ethylbenzene	50.1	49.0		ug/L		98	70 - 130	0	25
Methyl tert-butyl ether	50.2	45.8		ug/L		91	70 - 130	0	25
Naphthalene	50.2	52.5		ug/L		105	70 - 130	1	25
Toluene	50.1	48.2		ug/L		96	70 - 130	0	25
m-Xylene & p-Xylene	101	100		ug/L		100	70 - 130	0	25
o-Xylene	50.4	49.6		ug/L		98	70 - 130	0	25

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 410-389210/4
Matrix: Water
Analysis Batch: 389210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*101*		*70 - 130*

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 389210

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	2.0	U	50.1	51.3		ug/L		102	70 - 130
C9-C10 Aromatics	20	U J1	50.2	75.1	J J1	ug/L		150	70 - 130
Ethylbenzene	2.0	U	50.1	52.6		ug/L		105	70 - 130
Methyl tert-butyl ether	2.0	U	50.2	46.4		ug/L		93	70 - 130
Naphthalene	4.0	U	50.2	52.6		ug/L		105	70 - 130
Toluene	2.0	U	50.1	51.6		ug/L		103	70 - 130
m-Xylene & p-Xylene	5.0	U	101	107		ug/L		106	70 - 130
o-Xylene	2.0	U	50.4	52.4		ug/L		104	70 - 130

Surrogate	MS %Recovery	MS Qualifier	Limits
a,a,a-Trifluorotoluene (fid)	*103*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*103*		*70 - 130*

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 389210

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	2.0	U	50.1	45.2		ug/L		90	70 - 130	13	25
C9-C10 Aromatics	20	U J1	50.2	66.5	J J1	ug/L		133	70 - 130	12	25
Ethylbenzene	2.0	U	50.1	46.2		ug/L		92	70 - 130	13	25
Methyl tert-butyl ether	2.0	U	50.2	41.5		ug/L		83	70 - 130	11	25
Naphthalene	4.0	U	50.2	46.3		ug/L		92	70 - 130	13	25
Toluene	2.0	U	50.1	45.3		ug/L		90	70 - 130	13	25
m-Xylene & p-Xylene	5.0	U	101	93.9		ug/L		93	70 - 130	13	25
o-Xylene	2.0	U	50.4	46.0		ug/L		91	70 - 130	13	25

Surrogate	MSD %Recovery	MSD Qualifier	Limits
a,a,a-Trifluorotoluene (fid)	*101*		*70 - 130*
a,a,a-Trifluorotoluene (pid)	*104*		*70 - 130*

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-783438/1-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 783438

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
4,4'-DDE	0.0040	U M	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: MB 680-783438/1-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 783438

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDT	0.0040	U	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1
Aldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
alpha-BHC	0.0040	U M	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1
beta-BHC	0.0040	U M	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
delta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Dieldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Endosulfan I	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Endosulfan II	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Endosulfan sulfate	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Endrin	0.0040	U	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1
Endrin aldehyde	0.016	U	0.050	0.016	0.0040	ug/L		06/14/23 18:08	1
Endrin ketone	0.016	U	0.050	0.016	0.0040	ug/L		06/14/23 18:08	1
gamma-BHC (Lindane)	0.0040	U M	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1
Heptachlor	0.0040	U M	0.050	0.0040	0.0010	ug/L		06/14/23 18:08	1
Heptachlor epoxide	0.0040	U	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Methoxychlor	0.0040	U M	0.050	0.0040	0.0020	ug/L		06/14/23 18:08	1
Chlordane (technical)	0.40	U M	0.50	0.40	0.16	ug/L		06/14/23 18:08	1
Toxaphene	0.80	U	5.0	0.80	0.31	ug/L		06/14/23 18:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*83*		*14 - 130*	*06/13/23 17:04*	*06/14/23 18:08*	*1*
Tetrachloro-m-xylene	*85*		*44 - 124*	*06/13/23 17:04*	*06/14/23 18:08*	*1*

Lab Sample ID: LCS 680-783438/12-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 783438

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*87*		*14 - 130*
Tetrachloro-m-xylene	*86*		*44 - 124*

Lab Sample ID: LCS 680-783438/2-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 783438

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0400	0.0202	J Q	ug/L		50	56 - 143
4,4'-DDE	0.0400	0.0185	J Q	ug/L		46	57 - 135
4,4'-DDT	0.0400	0.0225	J	ug/L		56	51 - 143
Aldrin	0.0400	0.0153	J Q	ug/L		38	45 - 134
alpha-BHC	0.0400	0.0162	J Q	ug/L		40	54 - 138
beta-BHC	0.0400	0.0259	J	ug/L		65	56 - 136
delta-BHC	0.0400	0.0355	J	ug/L		89	52 - 142
Dieldrin	0.0400	0.0180	J Q	ug/L		45	60 - 136
Endosulfan I	0.0400	0.0160	J Q	ug/L		40	62 - 126
Endosulfan II	0.0400	0.0175	J Q	ug/L		44	52 - 135
Endosulfan sulfate	0.0400	0.0211	J Q	ug/L		53	62 - 133
Endrin	0.0400	0.0199	J Q	ug/L		50	60 - 138

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-783438/2-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 783438

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Endrin aldehyde	0.0400	0.0166	J Q	ug/L		41	51 - 132
Endrin ketone	0.0400	0.0186	J Q	ug/L		46	58 - 134
gamma-BHC (Lindane)	0.0400	0.0171	J Q	ug/L		43	59 - 134
Heptachlor	0.0400	0.0193	J Q	ug/L		48	54 - 130
Heptachlor epoxide	0.0400	0.0177	J Q	ug/L		44	61 - 133
Methoxychlor	0.0400	0.0262	J	ug/L		66	54 - 145

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*58*		*14 - 130*
Tetrachloro-m-xylene	*49*		*44 - 124*

Lab Sample ID: LCSD 680-783438/13-A
Matrix: Water
Analysis Batch: 783593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 783438

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*87*		*14 - 130*
Tetrachloro-m-xylene	*73*		*44 - 124*

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 783593

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 783438

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0039	U Q	0.0378	0.0309	J M	ug/L		82	56 - 143
4,4'-DDE	0.0039	U M Q	0.0378	0.0295	J	ug/L		78	57 - 135
4,4'-DDT	0.0039	U M	0.0378	0.0319	J	ug/L		84	51 - 143
Aldrin	0.0039	U Q	0.0378	0.0225	J	ug/L		59	45 - 134
alpha-BHC	0.0039	U Q	0.0378	0.0241	J	ug/L		64	54 - 138
beta-BHC	0.0039	U M	0.0378	0.0300	J	ug/L		79	56 - 136
delta-BHC	0.0039	U J1	0.0378	0.0300	J	ug/L		79	52 - 142
Dieldrin	0.0039	U Q	0.0378	0.0266	J M	ug/L		70	60 - 136
Endosulfan I	0.0039	U J1 Q	0.0378	0.0233	J	ug/L		62	62 - 126
Endosulfan II	0.0039	U Q	0.0378	0.0251	J	ug/L		66	52 - 135
Endosulfan sulfate	0.0039	U Q	0.0378	0.0339	J	ug/L		89	62 - 133
Endrin	0.0039	U Q	0.0378	0.0297	J	ug/L		78	60 - 138
Endrin aldehyde	0.016	U Q	0.0378	0.0201	J	ug/L		53	51 - 132
Endrin ketone	0.016	U Q	0.0378	0.0281	J	ug/L		74	58 - 134
gamma-BHC (Lindane)	0.0039	U Q	0.0378	0.0249	J	ug/L		66	59 - 134
Heptachlor	0.0039	U Q	0.0378	0.0248	J	ug/L		66	54 - 130
Heptachlor epoxide	0.0039	U Q	0.0378	0.0274	J	ug/L		72	61 - 133
Methoxychlor	0.0039	U	0.0378	0.0343	J	ug/L		91	54 - 145

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*86*		*14 - 130*
Tetrachloro-m-xylene	*77*		*44 - 124*

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: 680-236120-2 MSD
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783593
Prep Batch: 783438

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,4'-DDD	0.0039	U Q	0.0395	0.0318	J M	ug/L		80	56 - 143	3	30
4,4'-DDE	0.0039	U M Q	0.0395	0.0298	J	ug/L		75	57 - 135	1	30
4,4'-DDT	0.0039	U M	0.0395	0.0310	J	ug/L		78	51 - 143	3	30
Aldrin	0.0039	U Q	0.0395	0.0220	J	ug/L		56	45 - 134	2	30
alpha-BHC	0.0039	U Q	0.0395	0.0263	J	ug/L		67	54 - 138	9	30
beta-BHC	0.0039	U M	0.0395	0.0346	J	ug/L		87	56 - 136	14	30
delta-BHC	0.0039	U J1	0.0395	0.0413	J J1	ug/L		105	52 - 142	32	30
Dieldrin	0.0039	U Q	0.0395	0.0250	J	ug/L		63	60 - 136	6	30
Endosulfan I	0.0039	U Q	0.0395	0.0263	J	ug/L		67	62 - 126	4	30
Endosulfan II	0.0039	U Q	0.0395	0.0240	J	ug/L		61	52 - 135	5	30
Endosulfan sulfate	0.0039	U Q	0.0395	0.0327	J	ug/L		83	62 - 133	3	30
Endrin	0.0039	U Q	0.0395	0.0323	J	ug/L		82	60 - 138	8	30
Endrin aldehyde	0.016	U Q	0.0395	0.0245	J	ug/L		62	51 - 132	20	30
Endrin ketone	0.016	U Q	0.0395	0.0266	J	ug/L		67	58 - 134	5	30
gamma-BHC (Lindane)	0.0039	U Q	0.0395	0.0260	J	ug/L		66	59 - 134	4	30
Heptachlor	0.0039	U Q	0.0395	0.0252	J	ug/L		64	54 - 130	2	30
Heptachlor epoxide	0.0039	U Q	0.0395	0.0252	J	ug/L		64	61 - 133	8	30
Methoxychlor	0.0039	U	0.0395	0.0340	J	ug/L		86	54 - 145	1	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*77*		*14 - 130*
Tetrachloro-m-xylene	*72*		*44 - 124*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-388980/1-B
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 391881
Prep Batch: 388980

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C19-C36 Aliphatics	20	U M	50	20	10	ug/L		06/28/23 20:49	1
C9-C18 Aliphatics	60	U	90	60	30	ug/L		06/28/23 20:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*39*	*M Q*	*40 - 140*	*06/21/23 08:13*	*06/28/23 20:49*	*1*

Lab Sample ID: MB 410-388980/1-C
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 391880
Prep Batch: 388980

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Pyrene	10	U	12	10	5.0	ug/L		06/28/23 21:11	1
Benzo[g,h,i]perylene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Indeno[1,2,3-cd]pyrene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Benzo[b]fluoranthene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Fluoranthene	1.0	U	2.0	1.0	0.50	ug/L		06/28/23 21:11	1
Benzo[k]fluoranthene	3.0	U	4.0	3.0	1.5	ug/L		06/28/23 21:11	1

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 410-388980/1-C
Matrix: Water
Analysis Batch: 391880

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 388980

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthylene	1.4	U	2.0	1.4	0.70	ug/L		06/28/23 21:11	1
Chrysene	1.0	U	2.0	1.0	0.50	ug/L		06/28/23 21:11	1
Benzo[a]pyrene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Dibenz(a,h)anthracene	1.0	U	2.0	1.0	0.50	ug/L		06/28/23 21:11	1
Benzo[a]anthracene	1.4	U	2.0	1.4	0.70	ug/L		06/28/23 21:11	1
Acenaphthene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Phenanthrene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Fluorene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
Naphthalene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
2-Methylnaphthalene	1.2	U	2.0	1.2	0.60	ug/L		06/28/23 21:11	1
C11-C22 Aromatics (Adjusted)	19.9	J	40	30	10	ug/L		06/28/23 21:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*80*		*40 - 140*	*06/21/23 08:13*	*06/28/23 21:11*	*1*
o- terphenyl (Surr)	*47*		*40 - 140*	*06/21/23 08:13*	*06/28/23 21:11*	*1*

Lab Sample ID: LCS 410-388980/2-B
Matrix: Water
Analysis Batch: 391881

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
C19-C36 Aliphatics	321	141	M	ug/L		44	40 - 140
C9-C18 Aliphatics	241	90.5	M Q	ug/L		38	40 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*41*	*M*	*40 - 140*

Lab Sample ID: LCS 410-388980/2-C
Matrix: Water
Analysis Batch: 391880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Anthracene	40.1	18.7		ug/L		47	40 - 140
Pyrene	40.1	19.2		ug/L		48	40 - 140
Benzo[g,h,i]perylene	40.0	18.5		ug/L		46	40 - 140
Indeno[1,2,3-cd]pyrene	40.1	17.0		ug/L		42	40 - 140
Benzo[b]fluoranthene	40.2	19.0		ug/L		47	40 - 140
Fluoranthene	40.1	19.4		ug/L		48	40 - 140
Benzo[k]fluoranthene	40.1	19.4		ug/L		48	40 - 140
Acenaphthylene	40.1	16.3		ug/L		41	40 - 140
Chrysene	40.2	18.8		ug/L		47	40 - 140
Benzo[a]pyrene	40.2	18.0		ug/L		45	40 - 140
Dibenz(a,h)anthracene	40.0	18.5		ug/L		46	40 - 140
Benzo[a]anthracene	40.1	19.1		ug/L		48	40 - 140
Acenaphthene	40.2	16.3		ug/L		41	40 - 140
Phenanthrene	40.1	19.0		ug/L		47	40 - 140
Fluorene	40.1	17.5		ug/L		44	40 - 140
Naphthalene	40.1	13.3	Q	ug/L		33	40 - 140

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 410-388980/2-C
Matrix: Water
Analysis Batch: 391880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 388980

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2-Methylnaphthalene			40.1	14.4	Q	ug/L		36	40 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*88*		*40 - 140*
o- terphenyl (Surr)	*50*		*40 - 140*

Lab Sample ID: LCSD 410-388980/3-B
Matrix: Water
Analysis Batch: 391881

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 388980

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics			321	185	M Q	ug/L		58	40 - 140	27	25
C9-C18 Aliphatics			241	137	M Q	ug/L		57	40 - 140	41	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*55*	*M*	*40 - 140*

Lab Sample ID: LCSD 410-388980/3-C
Matrix: Water
Analysis Batch: 391880

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 388980

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene			40.1	25.0	Q	ug/L		62	40 - 140	29	25
Pyrene			40.1	24.5		ug/L		61	40 - 140	24	25
Benzo[g,h,i]perylene			40.0	23.5		ug/L		59	40 - 140	24	25
Indeno[1,2,3-cd]pyrene			40.1	21.9	Q	ug/L		55	40 - 140	26	25
Benzo[b]fluoranthene			40.2	24.9	Q	ug/L		62	40 - 140	27	25
Fluoranthene			40.1	24.7		ug/L		62	40 - 140	24	25
Benzo[k]fluoranthene			40.1	24.1		ug/L		60	40 - 140	22	25
Acenaphthylene			40.1	23.1	Q	ug/L		58	40 - 140	34	25
Chrysene			40.2	23.7		ug/L		59	40 - 140	23	25
Benzo[a]pyrene			40.2	23.2		ug/L		58	40 - 140	25	25
Dibenz(a,h)anthracene			40.0	23.8		ug/L		59	40 - 140	25	25
Benzo[a]anthracene			40.1	24.7		ug/L		62	40 - 140	25	25
Acenaphthene			40.2	22.8	Q	ug/L		57	40 - 140	33	25
Phenanthrene			40.1	25.1	Q	ug/L		63	40 - 140	28	25
Fluorene			40.1	24.1	Q	ug/L		60	40 - 140	32	25
Naphthalene			40.1	21.7	Q	ug/L		54	40 - 140	48	25
2-Methylnaphthalene			40.1	21.9	Q	ug/L		55	40 - 140	41	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*82*		*40 - 140*
o- terphenyl (Surr)	*63*		*40 - 140*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 391881

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
C19-C36 Aliphatics	19	U H M Q	309	237	H M	ug/L		77	40 - 140
C9-C18 Aliphatics	58	U H Q	232	181	H M	ug/L		78	40 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*70*	*M*	*40 - 140*

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 391880

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Anthracene	1.2	U H Q	38.6	28.3	H	ug/L		73	40 - 140
Pyrene	9.7	U H	38.6	28.5	H	ug/L		74	40 - 140
Benzo[g,h,i]perylene	1.2	U H	38.5	27.3	H	ug/L		71	40 - 140
Indeno[1,2,3-cd]pyrene	1.2	U H Q	38.6	25.4	H	ug/L		66	40 - 140
Benzo[b]fluoranthene	1.2	U H Q	38.6	28.7	H M	ug/L		74	40 - 140
Fluoranthene	0.97	U H	38.6	28.7	H	ug/L		74	40 - 140
Benzo[k]fluoranthene	2.9	U H	38.6	28.3	H M	ug/L		73	40 - 140
Acenaphthylene	1.4	U H Q	38.6	26.6	H	ug/L		69	40 - 140
Chrysene	0.97	U H	38.7	27.8	H	ug/L		72	40 - 140
Benzo[a]pyrene	1.2	U H	38.6	26.9	H	ug/L		70	40 - 140
Dibenz(a,h)anthracene	0.97	U H	38.5	27.2	H	ug/L		71	40 - 140
Benzo[a]anthracene	1.4	U H	38.6	28.0	H	ug/L		73	40 - 140
Acenaphthene	1.2	U H Q	38.6	26.8	H	ug/L		69	40 - 140
Phenanthrene	0.93	J H Q	38.6	28.7	H	ug/L		72	40 - 140
Fluorene	1.2	U H Q	38.6	27.8	H	ug/L		72	40 - 140
Naphthalene	1.2	U H Q	38.6	24.0	H	ug/L		62	40 - 140
2-Methylnaphthalene	1.2	U H Q	38.6	25.8	H	ug/L		67	40 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*80*		*40 - 140*
o- terphenyl (Surr)	*76*		*40 - 140*

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 391881

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics	19	U H M Q	310	195	H M	ug/L		63	40 - 140	19	50
C9-C18 Aliphatics	58	U H Q	233	141	H M	ug/L		61	40 - 140	25	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*57*	*M*	*40 - 140*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 391880

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 388980

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene	1.2	U H Q	38.7	19.9	H	ug/L		51	40 - 140	35	50
Pyrene	9.7	U H	38.7	20.2	H	ug/L		52	40 - 140	34	50
Benzo[g,h,i]perylene	1.2	U H	38.6	19.4	H	ug/L		50	40 - 140	34	50
Indeno[1,2,3-cd]pyrene	1.2	U H Q	38.7	17.8	H	ug/L		46	40 - 140	35	50
Benzo[b]fluoranthene	1.2	U H Q	38.8	20.1	H	ug/L		52	40 - 140	35	50
Fluoranthene	0.97	U H	38.7	20.3	H	ug/L		53	40 - 140	34	50
Benzo[k]fluoranthene	2.9	U H	38.7	20.2	H	ug/L		52	40 - 140	33	50
Acenaphthylene	1.4	U H Q	38.7	18.6	H	ug/L		48	40 - 140	35	50
Chrysene	0.97	U H	38.8	19.8	H	ug/L		51	40 - 140	34	50
Benzo[a]pyrene	1.2	U H	38.8	19.0	H	ug/L		49	40 - 140	34	50
Dibenz(a,h)anthracene	0.97	U H	38.6	19.7	H	ug/L		51	40 - 140	32	50
Benzo[a]anthracene	1.4	U H	38.7	19.8	H	ug/L		51	40 - 140	34	50
Acenaphthene	1.2	U H Q	38.8	18.5	H	ug/L		48	40 - 140	36	50
Phenanthrene	0.93	J H Q	38.7	20.2	H	ug/L		50	40 - 140	34	50
Fluorene	1.2	U H Q	38.7	19.3	H	ug/L		50	40 - 140	36	50
Naphthalene	1.2	U H Q	38.7	17.1	H	ug/L		44	40 - 140	34	50
2-Methylnaphthalene	1.2	U H Q	38.7	17.7	H	ug/L		46	40 - 140	37	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*63*		*40 - 140*
o- terphenyl (Surr)	*53*		*40 - 140*

Lab Sample ID: MB 410-392793/1-B
Matrix: Water
Analysis Batch: 394765

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 392793

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C19-C36 Aliphatics	20	U	50	20	10	ug/L		07/07/23 19:15	1
C9-C18 Aliphatics	60	U M	90	60	30	ug/L		07/07/23 19:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*76*		*40 - 140*	*06/30/23 14:30*	*07/07/23 19:15*	*1*

Lab Sample ID: MB 410-392793/1-C
Matrix: Water
Analysis Batch: 394760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 392793

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Pyrene	10	U	12	10	5.0	ug/L		07/07/23 19:15	1
Benzo[g,h,i]perylene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Indeno[1,2,3-cd]pyrene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Benzo[b]fluoranthene	1.2	U M	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Fluoranthene	1.0	U	2.0	1.0	0.50	ug/L		07/07/23 19:15	1
Benzo[k]fluoranthene	3.0	U M	4.0	3.0	1.5	ug/L		07/07/23 19:15	1
Acenaphthylene	1.4	U	2.0	1.4	0.70	ug/L		07/07/23 19:15	1
Chrysene	1.0	U	2.0	1.0	0.50	ug/L		07/07/23 19:15	1
Benzo[a]pyrene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 410-392793/1-C
Matrix: Water
Analysis Batch: 394760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 392793

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Dibenz(a,h)anthracene	1.0	U	2.0	1.0	0.50	ug/L		07/07/23 19:15	1
Benzo[a]anthracene	1.4	U	2.0	1.4	0.70	ug/L		07/07/23 19:15	1
Acenaphthene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Phenanthrene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Fluorene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
Naphthalene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
2-Methylnaphthalene	1.2	U	2.0	1.2	0.60	ug/L		07/07/23 19:15	1
C11-C22 Aromatics (Adjusted)	30	U	40	30	10	ug/L		07/07/23 19:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*91*		*40 - 140*	*06/30/23 14:30*	*07/07/23 19:15*	*1*
o- terphenyl (Surr)	*80*		*40 - 140*	*06/30/23 14:30*	*07/07/23 19:15*	*1*

Lab Sample ID: LCS 410-392793/2-B
Matrix: Water
Analysis Batch: 394765

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 392793

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C19-C36 Aliphatics			321	244		ug/L		76	40 - 140		
C9-C18 Aliphatics			241	179		ug/L		74	40 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*71*		*40 - 140*

Lab Sample ID: LCS 410-392793/2-C
Matrix: Water
Analysis Batch: 394760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 392793

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Anthracene			40.1	31.7		ug/L		79	40 - 140		
Pyrene			40.1	34.4		ug/L		86	40 - 140		
Benzo[g,h,i]perylene			40.0	33.3		ug/L		83	40 - 140		
Indeno[1,2,3-cd]pyrene			40.1	31.9	M	ug/L		80	40 - 140		
Benzo[b]fluoranthene			40.2	27.6	M	ug/L		69	40 - 140		
Fluoranthene			40.1	32.2		ug/L		80	40 - 140		
Benzo[k]fluoranthene			40.1	40.4	M	ug/L		101	40 - 140		
Acenaphthylene			40.1	29.5		ug/L		74	40 - 140		
Chrysene			40.2	35.6		ug/L		89	40 - 140		
Benzo[a]pyrene			40.2	31.6		ug/L		79	40 - 140		
Dibenz(a,h)anthracene			40.0	32.5		ug/L		81	40 - 140		
Benzo[a]anthracene			40.1	30.4		ug/L		76	40 - 140		
Acenaphthene			40.2	30.6		ug/L		76	40 - 140		
Phenanthrene			40.1	31.8		ug/L		79	40 - 140		
Fluorene			40.1	31.3		ug/L		78	40 - 140		
Naphthalene			40.1	26.7		ug/L		67	40 - 140		
2-Methylnaphthalene			40.1	28.5		ug/L		71	40 - 140		

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 410-392793/2-C
Matrix: Water
Analysis Batch: 394760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 392793

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	91		40 - 140
o- terphenyl (Surr)	82		40 - 140

Lab Sample ID: LCSD 410-392793/3-B
Matrix: Water
Analysis Batch: 394765

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 392793

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics			321	241		ug/L		75	40 - 140	1	25
C9-C18 Aliphatics			241	176		ug/L		73	40 - 140	2	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1-Chlorooctadecane (Surr)	76		40 - 140

Lab Sample ID: LCSD 410-392793/3-C
Matrix: Water
Analysis Batch: 394760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 392793

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene			40.1	24.5	Q	ug/L		61	40 - 140	26	25
Pyrene			40.1	26.2	Q	ug/L		65	40 - 140	27	25
Benzo[g,h,i]perylene			40.0	25.7	Q	ug/L		64	40 - 140	26	25
Indeno[1,2,3-cd]pyrene			40.1	24.2	M Q	ug/L		60	40 - 140	28	25
Benzo[b]fluoranthene			40.2	26.2	M	ug/L		65	40 - 140	5	25
Fluoranthene			40.1	24.8	Q	ug/L		62	40 - 140	26	25
Benzo[k]fluoranthene			40.1	26.4	M Q	ug/L		66	40 - 140	42	25
Acenaphthylene			40.1	22.5	Q	ug/L		56	40 - 140	27	25
Chrysene			40.2	26.7	Q	ug/L		66	40 - 140	29	25
Benzo[a]pyrene			40.2	24.7		ug/L		61	40 - 140	25	25
Dibenz(a,h)anthracene			40.0	25.4		ug/L		63	40 - 140	24	25
Benzo[a]anthracene			40.1	24.4		ug/L		61	40 - 140	22	25
Acenaphthene			40.2	23.4	Q	ug/L		58	40 - 140	27	25
Phenanthrene			40.1	24.5	Q	ug/L		61	40 - 140	26	25
Fluorene			40.1	24.0	Q	ug/L		60	40 - 140	27	25
Naphthalene			40.1	20.1	Q	ug/L		50	40 - 140	28	25
2-Methylnaphthalene			40.1	21.8	Q	ug/L		54	40 - 140	27	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	72		40 - 140
o- terphenyl (Surr)	63		40 - 140

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 394760

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 392793

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Anthracene - RE	1.2	U H J1 Q	38.2	14.6	H J1	ug/L		38	40 - 140
Pyrene - RE	9.6	U H Q	38.3	15.6	H	ug/L		41	40 - 140
Benzo[g,h,i]perylene - RE	1.2	U H Q	38.1	15.3	H	ug/L		40	40 - 140
Indeno[1,2,3-cd]pyrene - RE	1.2	U H J1 Q	38.2	14.2	H J1	ug/L		37	40 - 140
Benzo[b]fluoranthene - RE	1.2	U H	38.3	15.8	H M	ug/L		41	40 - 140
Fluoranthene - RE	0.96	U H J1 Q	38.2	14.8	H J1	ug/L		39	40 - 140
Benzo[k]fluoranthene - RE	2.9	U H Q	38.3	15.2	H M	ug/L		40	40 - 140
Acenaphthylene - RE	1.3	U H J1 Q	38.2	13.5	H J1	ug/L		35	40 - 140
Chrysene - RE	0.96	U H Q	38.3	15.9	H	ug/L		41	40 - 140
Benzo[a]pyrene - RE	1.2	U H J1	38.3	14.5	H J1	ug/L		38	40 - 140
Dibenz(a,h)anthracene - RE	0.96	U H	38.2	15.1	H	ug/L		40	40 - 140
Benzo[a]anthracene - RE	1.3	U H J1	38.2	14.6	H J1	ug/L		38	40 - 140
Acenaphthene - RE	1.2	U H J1 Q	38.3	14.0	H J1	ug/L		37	40 - 140
Phenanthrene - RE	1.2	U H J1 Q	38.2	14.5	H J1	ug/L		38	40 - 140
Fluorene - RE	1.2	U H J1 Q	38.2	14.2	H J1	ug/L		37	40 - 140
Naphthalene - RE	1.2	U H M J1 Q	38.2	12.7	H J1	ug/L		33	40 - 140
2-Methylnaphthalene - RE	1.2	U H J1 Q	38.2	13.5	H J1	ug/L		35	40 - 140
C19-C36 Aliphatics - RE	19	U H	306	152	H	ug/L		50	40 - 140
C9-C18 Aliphatics - RE	58	U H M	230	124	H	ug/L		54	40 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1-Chlorooctadecane (Surr) - RE	*47*		*40 - 140*
2-Fluorobiphenyl (Surr) - RE	*71*		*40 - 140*
o- terphenyl (Surr) - RE	*36*	*Q*	*40 - 140*

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 394760

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 392793

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene - RE	1.2	U H J1 Q	38.4	23.0	H	ug/L		60	40 - 140	45	50
Pyrene - RE	9.6	U H Q	38.4	24.4	H	ug/L		64	40 - 140	44	50
Benzo[g,h,i]perylene - RE	1.2	U H Q	38.3	23.8	H	ug/L		62	40 - 140	44	50
Indeno[1,2,3-cd]pyrene - RE	1.2	U H J1 Q	38.4	22.3	H M	ug/L		58	40 - 140	45	50
Benzo[b]fluoranthene - RE	1.2	U H	38.4	23.3	H	ug/L		61	40 - 140	38	50
Fluoranthene - RE	0.96	U H J1 Q	38.4	23.2	H	ug/L		60	40 - 140	44	50
Benzo[k]fluoranthene - RE	2.9	U H Q	38.4	25.2	H	ug/L		66	40 - 140	49	50
Acenaphthylene - RE	1.3	U H J1 Q	38.4	21.8	H	ug/L		57	40 - 140	47	50
Chrysene - RE	0.96	U H Q	38.5	23.6	H	ug/L		61	40 - 140	39	50
Benzo[a]pyrene - RE	1.2	U H J1	38.4	22.7	H	ug/L		59	40 - 140	44	50
Dibenz(a,h)anthracene - RE	0.96	U H	38.3	23.3	H	ug/L		61	40 - 140	43	50
Benzo[a]anthracene - RE	1.3	U H J1	38.4	23.4	H	ug/L		61	40 - 140	46	50
Acenaphthene - RE	1.2	U H J1 Q	38.4	22.5	H	ug/L		58	40 - 140	47	50
Phenanthrene - RE	1.2	U H J1 Q	38.4	23.0	H	ug/L		60	40 - 140	45	50
Fluorene - RE	1.2	U H J1 Q	38.4	22.8	H	ug/L		59	40 - 140	46	50
Naphthalene - RE	1.2	U H M J1 Q	38.4	22.2	H J1	ug/L		58	40 - 140	55	50
2-Methylnaphthalene - RE	1.2	U H J1 Q	38.4	22.0	H	ug/L		57	40 - 140	48	50

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) - RE (Continued)

Lab Sample ID: 680-236120-2 MSD
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 394765
Prep Batch: 392793

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics - RE	19	U H	308	220	H	ug/L		72	40 - 140	36	50
C9-C18 Aliphatics - RE	58	U H M	231	189	H	ug/L		82	40 - 140	41	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr) - RE	*69*		*40 - 140*
2-Fluorobiphenyl (Surr) - RE	*75*		*40 - 140*
o- terphenyl (Surr) - RE	*62*		*40 - 140*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-783989/33
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783989

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	0.50	U	0.50	0.50	0.20	mg/L		06/16/23 17:16	1
Sulfate	1.0	U	1.0	1.0	0.40	mg/L		06/16/23 17:16	1

Lab Sample ID: LCS 680-783989/34
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783989

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.89		mg/L		99	87 - 111
Sulfate	10.0	9.81		mg/L		98	87 - 112

Lab Sample ID: LCSD 680-783989/35
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783989

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	10.0	9.87		mg/L		99	87 - 111	0	15
Sulfate	10.0	9.80		mg/L		98	87 - 112	0	15

Lab Sample ID: MB 680-784086/2
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784086

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	0.50	U	0.50	0.50	0.20	mg/L		06/17/23 10:11	1
Sulfate	1.0	U	1.0	1.0	0.40	mg/L		06/17/23 10:11	1

Lab Sample ID: LCS 680-784086/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 784086

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.82		mg/L		98	87 - 111
Sulfate	10.0	9.72	M	mg/L		97	87 - 112

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 680-784086/5
Matrix: Water
Analysis Batch: 784086

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			10.0	9.86		mg/L		99	87 - 111	0	15
Sulfate			10.0	9.73		mg/L		97	87 - 112	0	15

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 784086

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	250	D	50.0	297	4 D	mg/L		98	87 - 111
Sulfate	14	D M	50.0	62.8	D M	mg/L		97	87 - 112

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 784086

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	250	D	50.0	301	4 D	mg/L		106	87 - 111	1	15
Sulfate	14	D M	50.0	64.2	D M	mg/L		100	87 - 112	2	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-782980/1-A
Matrix: Water
Analysis Batch: 783291

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 782980

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	10	U	20	10	4.4	ug/L		06/12/23 12:46	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/12/23 12:46	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/12/23 12:46	1
Copper	10	U	20	10	3.2	ug/L		06/12/23 12:46	1
Iron	50	U	100	50	20	ug/L		06/12/23 12:46	1
Lead	20	U	40	20	6.6	ug/L		06/12/23 12:46	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/12/23 12:46	1
Selenium	20	U	25	20	10	ug/L		06/12/23 12:46	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/12/23 12:46	1

Lab Sample ID: LCS 680-782980/2-A
Matrix: Water
Analysis Batch: 783291

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 782980

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium			100	106		ug/L		106	88 - 113
Cadmium			50.0	53.6		ug/L		107	88 - 113
Chromium			100	106		ug/L		106	90 - 113
Copper			100	110		ug/L		110	86 - 114
Iron			5000	5130		ug/L		103	87 - 115
Lead			500	500		ug/L		100	86 - 113
Manganese			400	424		ug/L		106	90 - 114
Selenium			100	96.9		ug/L		97	83 - 114
Silver			50.0	48.3		ug/L		97	84 - 115

Method: 6010C - Metals (ICP)

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 783291

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total Recoverable
Prep Batch: 782980

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	9.1	J	100	114		ug/L		105	88 - 113
Cadmium	1.0	U	50.0	53.5		ug/L		107	88 - 113
Chromium	4.0	U	100	107		ug/L		107	90 - 113
Copper	10	U	100	107		ug/L		107	86 - 114
Iron	50	U	5000	5130		ug/L		103	87 - 115
Lead	20	U	500	514		ug/L		103	86 - 113
Manganese	5.0	U	400	418		ug/L		104	90 - 114
Selenium	20	U	100	102		ug/L		102	83 - 114
Silver	5.0	U	50.0	50.1		ug/L		100	84 - 115

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 783291

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total Recoverable
Prep Batch: 782980

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	9.1	J	100	114		ug/L		105	88 - 113	1	20
Cadmium	1.0	U	50.0	53.1		ug/L		106	88 - 113	1	20
Chromium	4.0	U	100	106		ug/L		106	90 - 113	1	20
Copper	10	U	100	108		ug/L		108	86 - 114	1	20
Iron	50	U	5000	5090		ug/L		102	87 - 115	1	20
Lead	20	U	500	508		ug/L		102	86 - 113	1	20
Manganese	5.0	U	400	414		ug/L		103	90 - 114	1	20
Selenium	20	U	100	101		ug/L		101	83 - 114	1	20
Silver	5.0	U	50.0	49.8		ug/L		100	84 - 115	1	20

Lab Sample ID: MB 680-783457/1-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783457

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	10	U	20	10	4.4	ug/L		06/14/23 16:17	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		06/14/23 16:17	1
Chromium	4.0	U	10	4.0	1.1	ug/L		06/14/23 16:17	1
Copper	10	U	20	10	3.2	ug/L		06/14/23 16:17	1
Iron	50	U	100	50	20	ug/L		06/14/23 16:17	1
Lead	20	U	40	20	6.6	ug/L		06/14/23 16:17	1
Manganese	5.0	U	10	5.0	1.3	ug/L		06/14/23 16:17	1
Selenium	20	U	25	20	10	ug/L		06/14/23 16:17	1
Silver	5.0	U	10	5.0	1.5	ug/L		06/14/23 16:17	1

Lab Sample ID: LCS 680-783457/2-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	100	109		ug/L		109	88 - 113
Cadmium	50.0	55.4		ug/L		111	88 - 113
Chromium	100	109		ug/L		109	90 - 113
Copper	100	108		ug/L		108	86 - 114

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-783457/2-A
Matrix: Water
Analysis Batch: 783688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	5220		ug/L		104	87 - 115
Lead	500	521		ug/L		104	86 - 113
Manganese	400	435		ug/L		109	90 - 114
Selenium	100	94.0		ug/L		94	83 - 114
Silver	50.0	47.8		ug/L		96	84 - 115

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-782979/1-A
Matrix: Water
Analysis Batch: 783273

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 782979

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/12/23 12:11	1

Lab Sample ID: LCS 680-782979/2-A
Matrix: Water
Analysis Batch: 783273

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 782979

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	112		ug/L		112	84 - 116

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 783273

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total Recoverable
Prep Batch: 782979

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	3.0	U	100	113		ug/L		113	84 - 116

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 783273

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total Recoverable
Prep Batch: 782979

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	3.0	U	100	113		ug/L		113	84 - 116	0	20

Lab Sample ID: MB 680-783458/1-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 783458

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		06/14/23 17:48	1

Lab Sample ID: LCS 680-783458/2-A
Matrix: Water
Analysis Batch: 783691

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 783458

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	115		ug/L		115	84 - 116

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-783678/1-A
Matrix: Water
Analysis Batch: 783828

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 783678

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		06/15/23 11:21	1

Lab Sample ID: LCS 680-783678/2-A
Matrix: Water
Analysis Batch: 783828

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 783678

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.56		ug/L		102	80 - 124

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 783828

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 783678

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.20	U	1.00	0.972		ug/L		97	80 - 124

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 783828

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA
Prep Batch: 783678

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.20	U	1.00	0.981		ug/L		98	80 - 124	1	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-783585/4
Matrix: Water
Analysis Batch: 783585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		06/13/23 23:59	1

Lab Sample ID: LCS 680-783585/6
Matrix: Water
Analysis Batch: 783585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	243		mg/L		97	90 - 112

Lab Sample ID: LCSD 680-783585/31
Matrix: Water
Analysis Batch: 783585

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	244		mg/L		98	90 - 112	1	30

Method: 2320B-2011 - Alkalinity, Total (Continued)

Lab Sample ID: MB 680-784252/4
Matrix: Water
Analysis Batch: 784252

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		06/16/23 17:18	1

Lab Sample ID: LCS 680-784252/6
Matrix: Water
Analysis Batch: 784252

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	241		mg/L		96	90 - 112

Lab Sample ID: LCSD 680-784252/31
Matrix: Water
Analysis Batch: 784252

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	246		mg/L		99	90 - 112	2	30

Lab Sample ID: 680-236120-4 DU
Matrix: Water
Analysis Batch: 784252

Client Sample ID: LFM-DUP01-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	98		97.5		mg/L		0.4	30

Lab Sample ID: MB 680-784254/4
Matrix: Water
Analysis Batch: 784254

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		06/16/23 22:59	1

Lab Sample ID: LCS 680-784254/6
Matrix: Water
Analysis Batch: 784254

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	242		mg/L		97	90 - 112

Lab Sample ID: LCSD 680-784254/31
Matrix: Water
Analysis Batch: 784254

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	246		mg/L		98	90 - 112	2	30

Method: 2540C-2011 - Total Dissolved Solids (Dried at 180 °C)

Lab Sample ID: MB 680-783381/1
Matrix: Water
Analysis Batch: 783381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Dissolved Solids	5.0	U	6.0	5.0	6.0	mg/L		06/13/23 12:47	1

Lab Sample ID: LCS 680-783381/2
Matrix: Water
Analysis Batch: 783381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	2410	2410		mg/L		100	80 - 120

Lab Sample ID: LCSD 680-783381/3
Matrix: Water
Analysis Batch: 783381

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Dissolved Solids	2410	2410		mg/L		100	80 - 120	0	25

Lab Sample ID: 680-236120-2 DU
Matrix: Water
Analysis Batch: 783381

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	490		492		mg/L		0.4	5

Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-785197/17
Matrix: Water
Analysis Batch: 785197

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate Nitrite as N	0.025	U	0.10	0.025	0.010	mg/L		06/22/23 17:10	1

Lab Sample ID: LCS 680-785197/18
Matrix: Water
Analysis Batch: 785197

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.00	0.996		mg/L		100	90 - 110

Lab Sample ID: 680-236120-2 MS
Matrix: Water
Analysis Batch: 785197

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	0.26		1.00	1.27		mg/L		101	90 - 110

Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 680-236120-2 MSD
Matrix: Water
Analysis Batch: 785197

Client Sample ID: LFM-99-02B-SPR23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.26		1.00	1.30		mg/L		104	90 - 110	2	10

Method: 410.4 - COD

Lab Sample ID: MB 280-616255/5
Matrix: Water
Analysis Batch: 616255

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		06/15/23 11:42	1

Lab Sample ID: LCS 280-616255/3
Matrix: Water
Analysis Batch: 616255

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	100	104		mg/L		104	90 - 110

Lab Sample ID: LCSD 280-616255/4
Matrix: Water
Analysis Batch: 616255

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	100	104		mg/L		104	90 - 110	0	11

Lab Sample ID: MB 280-616783/5
Matrix: Water
Analysis Batch: 616783

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		06/20/23 12:11	1

Lab Sample ID: LCS 280-616783/3
Matrix: Water
Analysis Batch: 616783

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	100	105		mg/L		105	90 - 110

Lab Sample ID: LCSD 280-616783/4
Matrix: Water
Analysis Batch: 616783

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	100	103		mg/L		103	90 - 110	2	11

Method: 410.4 - COD (Continued)

Lab Sample ID: 680-236120-2 MS
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 616783

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chemical Oxygen Demand	20	U J1	50.0	52.9		mg/L		106	90 - 110		

Lab Sample ID: 680-236120-2 MSD
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 616783

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	20	U J1	50.0	53.5		mg/L		107	90 - 110	1	11

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-783892/12-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783962
Prep Batch: 783892

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		06/16/23 09:09	1

Lab Sample ID: LCS 680-783892/13-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783962
Prep Batch: 783892

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0477		mg/L		95	83 - 116

Lab Sample ID: 680-236120-2 MS
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783962
Prep Batch: 783892

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Cyanide, Total	0.0050	U	0.0500	0.0539		mg/L		108	83 - 116		

Lab Sample ID: 680-236120-2 MSD
Client Sample ID: LFM-99-02B-SPR23
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 783962
Prep Batch: 783892

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.0050	U	0.0500	0.0524		mg/L		105	83 - 116	3	20

GC VOA

Analysis Batch: 389210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	MAVPH	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	MAVPH	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	MAVPH	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	MAVPH	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	MAVPH	
MB 410-389210/2	Method Blank	Total/NA	Water	MAVPH	
LCS 410-389210/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 410-389210/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	MAVPH	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	MAVPH	

GC Semi VOA

Prep Batch: 388980

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	3510C	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	3510C	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	3510C	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	3510C	
MB 410-388980/1-B	Method Blank	Total/NA	Water	3510C	
MB 410-388980/1-C	Method Blank	Total/NA	Water	3510C	
LCS 410-388980/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-388980/2-C	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-388980/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
LCSD 410-388980/3-C	Lab Control Sample Dup	Total/NA	Water	3510C	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	3510C	

Cleanup Batch: 391587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	3630C	388980
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	3630C	388980
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	3630C	388980
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	3630C	388980
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	3630C	388980
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	3630C	388980
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	3630C	388980
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	3630C	388980
MB 410-388980/1-B	Method Blank	Total/NA	Water	3630C	388980
MB 410-388980/1-C	Method Blank	Total/NA	Water	3630C	388980
LCS 410-388980/2-B	Lab Control Sample	Total/NA	Water	3630C	388980
LCS 410-388980/2-C	Lab Control Sample	Total/NA	Water	3630C	388980
LCSD 410-388980/3-B	Lab Control Sample Dup	Total/NA	Water	3630C	388980
LCSD 410-388980/3-C	Lab Control Sample Dup	Total/NA	Water	3630C	388980
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	3630C	388980

GC Semi VOA

Analysis Batch: 391880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	MA-EPH	391587
MB 410-388980/1-C	Method Blank	Total/NA	Water	MA-EPH	391587
LCS 410-388980/2-C	Lab Control Sample	Total/NA	Water	MA-EPH	391587
LCSD 410-388980/3-C	Lab Control Sample Dup	Total/NA	Water	MA-EPH	391587
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587

Analysis Batch: 391881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	MA-EPH	391587
MB 410-388980/1-B	Method Blank	Total/NA	Water	MA-EPH	391587
LCS 410-388980/2-B	Lab Control Sample	Total/NA	Water	MA-EPH	391587
LCSD 410-388980/3-B	Lab Control Sample Dup	Total/NA	Water	MA-EPH	391587
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	391587

Prep Batch: 392793

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1 - RE	LFM-03-07-SPR23	Total/NA	Water	3510C	
680-236120-2 - RE	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-3 - RE	LFM-99-05A-SPR23	Total/NA	Water	3510C	
680-236120-4 - RE	LFM-DUP01-SPR23	Total/NA	Water	3510C	
680-236120-5 - RE	LFM-99-06A-RP-SPR23	Total/NA	Water	3510C	
MB 410-392793/1-B	Method Blank	Total/NA	Water	3510C	
MB 410-392793/1-C	Method Blank	Total/NA	Water	3510C	
LCS 410-392793/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-392793/2-C	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-392793/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
LCSD 410-392793/3-C	Lab Control Sample Dup	Total/NA	Water	3510C	
680-236120-2 MS - RE	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-2 MSD - RE	LFM-99-02B-SPR23	Total/NA	Water	3510C	

Cleanup Batch: 394479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1 - RE	LFM-03-07-SPR23	Total/NA	Water	3630C	392793
680-236120-1 - RE	LFM-03-07-SPR23	Total/NA	Water	3630C	392793
680-236120-2 - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793
680-236120-2 - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793
680-236120-3 - RE	LFM-99-05A-SPR23	Total/NA	Water	3630C	392793
680-236120-3 - RE	LFM-99-05A-SPR23	Total/NA	Water	3630C	392793
680-236120-4 - RE	LFM-DUP01-SPR23	Total/NA	Water	3630C	392793
680-236120-4 - RE	LFM-DUP01-SPR23	Total/NA	Water	3630C	392793
680-236120-5 - RE	LFM-99-06A-RP-SPR23	Total/NA	Water	3630C	392793

GC Semi VOA (Continued)

Cleanup Batch: 394479 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-5 - RE	LFM-99-06A-RP-SPR23	Total/NA	Water	3630C	392793
MB 410-392793/1-B	Method Blank	Total/NA	Water	3630C	392793
MB 410-392793/1-C	Method Blank	Total/NA	Water	3630C	392793
LCS 410-392793/2-B	Lab Control Sample	Total/NA	Water	3630C	392793
LCS 410-392793/2-C	Lab Control Sample	Total/NA	Water	3630C	392793
LCSD 410-392793/3-B	Lab Control Sample Dup	Total/NA	Water	3630C	392793
LCSD 410-392793/3-C	Lab Control Sample Dup	Total/NA	Water	3630C	392793
680-236120-2 MS - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793
680-236120-2 MS - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793
680-236120-2 MSD - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793
680-236120-2 MSD - RE	LFM-99-02B-SPR23	Total/NA	Water	3630C	392793

Analysis Batch: 394760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1 - RE	LFM-03-07-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-2 - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-3 - RE	LFM-99-05A-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-4 - RE	LFM-DUP01-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-5 - RE	LFM-99-06A-RP-SPR23	Total/NA	Water	MA-EPH	394479
MB 410-392793/1-C	Method Blank	Total/NA	Water	MA-EPH	394479
LCS 410-392793/2-C	Lab Control Sample	Total/NA	Water	MA-EPH	394479
LCSD 410-392793/3-C	Lab Control Sample Dup	Total/NA	Water	MA-EPH	394479
680-236120-2 MS - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-2 MSD - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479

Analysis Batch: 394765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1 - RE	LFM-03-07-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-2 - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-3 - RE	LFM-99-05A-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-4 - RE	LFM-DUP01-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-5 - RE	LFM-99-06A-RP-SPR23	Total/NA	Water	MA-EPH	394479
MB 410-392793/1-B	Method Blank	Total/NA	Water	MA-EPH	394479
LCS 410-392793/2-B	Lab Control Sample	Total/NA	Water	MA-EPH	394479
LCSD 410-392793/3-B	Lab Control Sample Dup	Total/NA	Water	MA-EPH	394479
680-236120-2 MS - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479
680-236120-2 MSD - RE	LFM-99-02B-SPR23	Total/NA	Water	MA-EPH	394479

Prep Batch: 783438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	3510C	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	3510C	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	3510C	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	3510C	
MB 680-783438/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-783438/12-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 680-783438/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 680-783438/13-A	Lab Control Sample Dup	Total/NA	Water	3510C	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	3510C	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	3510C	

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Analysis Batch: 783593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	8081B 8082A	783438
MB 680-783438/1-A	Method Blank	Total/NA	Water	8081B 8082A	783438
LCS 680-783438/12-A	Lab Control Sample	Total/NA	Water	8081B 8082A	783438
LCS 680-783438/2-A	Lab Control Sample	Total/NA	Water	8081B 8082A	783438
LCSD 680-783438/13-A	Lab Control Sample Dup	Total/NA	Water	8081B 8082A	783438
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	8081B 8082A	783438
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	8081B 8082A	783438

Analysis Batch: 784780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	8081B 8082A	783438
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	8081B 8082A	783438
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	8081B 8082A	783438
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	8081B 8082A	783438

HPLC/IC

Analysis Batch: 783989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	9056A	
MB 680-783989/33	Method Blank	Total/NA	Water	9056A	
LCS 680-783989/34	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-783989/35	Lab Control Sample Dup	Total/NA	Water	9056A	

Analysis Batch: 784086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1 - DL	LFM-03-07-SPR23	Total/NA	Water	9056A	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	9056A	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	9056A	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	9056A	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	9056A	
MB 680-784086/2	Method Blank	Total/NA	Water	9056A	
LCS 680-784086/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-784086/5	Lab Control Sample Dup	Total/NA	Water	9056A	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	9056A	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	9056A	

Metals

Prep Batch: 782979

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total Recoverable	Water	3005A	
680-236120-2	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	
MB 680-782979/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-782979/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236120-2 MS	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	
680-236120-2 MSD	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	

Prep Batch: 782980

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total Recoverable	Water	3005A	
680-236120-2	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 782980 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-782980/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-782980/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-236120-2 MS	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	
680-236120-2 MSD	LFM-99-02B-SPR23	Total Recoverable	Water	3005A	

Analysis Batch: 783273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total Recoverable	Water	6020A	782979
680-236120-2	LFM-99-02B-SPR23	Total Recoverable	Water	6020A	782979
MB 680-782979/1-A	Method Blank	Total Recoverable	Water	6020A	782979
LCS 680-782979/2-A	Lab Control Sample	Total Recoverable	Water	6020A	782979
680-236120-2 MS	LFM-99-02B-SPR23	Total Recoverable	Water	6020A	782979
680-236120-2 MSD	LFM-99-02B-SPR23	Total Recoverable	Water	6020A	782979

Analysis Batch: 783291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total Recoverable	Water	6010C	782980
680-236120-2	LFM-99-02B-SPR23	Total Recoverable	Water	6010C	782980
MB 680-782980/1-A	Method Blank	Total Recoverable	Water	6010C	782980
LCS 680-782980/2-A	Lab Control Sample	Total Recoverable	Water	6010C	782980
680-236120-2 MS	LFM-99-02B-SPR23	Total Recoverable	Water	6010C	782980
680-236120-2 MSD	LFM-99-02B-SPR23	Total Recoverable	Water	6010C	782980

Prep Batch: 783457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-3	LFM-99-05A-SPR23	Total Recoverable	Water	3005A	
680-236120-4	LFM-DUP01-SPR23	Total Recoverable	Water	3005A	
680-236120-5	LFM-99-06A-RP-SPR23	Total Recoverable	Water	3005A	
MB 680-783457/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783457/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-3	LFM-99-05A-SPR23	Total Recoverable	Water	3005A	
680-236120-4	LFM-DUP01-SPR23	Total Recoverable	Water	3005A	
680-236120-5	LFM-99-06A-RP-SPR23	Total Recoverable	Water	3005A	
MB 680-783458/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-783458/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 783678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	7470A	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	7470A	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	7470A	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	7470A	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	7470A	
MB 680-783678/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-783678/2-A	Lab Control Sample	Total/NA	Water	7470A	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	7470A	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	7470A	

Metals

Analysis Batch: 783688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-3	LFM-99-05A-SPR23	Total Recoverable	Water	6010C	783457
680-236120-4	LFM-DUP01-SPR23	Total Recoverable	Water	6010C	783457
680-236120-5	LFM-99-06A-RP-SPR23	Total Recoverable	Water	6010C	783457
MB 680-783457/1-A	Method Blank	Total Recoverable	Water	6010C	783457
LCS 680-783457/2-A	Lab Control Sample	Total Recoverable	Water	6010C	783457

Analysis Batch: 783691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-3	LFM-99-05A-SPR23	Total Recoverable	Water	6020A	783458
680-236120-4	LFM-DUP01-SPR23	Total Recoverable	Water	6020A	783458
680-236120-5	LFM-99-06A-RP-SPR23	Total Recoverable	Water	6020A	783458
MB 680-783458/1-A	Method Blank	Total Recoverable	Water	6020A	783458
LCS 680-783458/2-A	Lab Control Sample	Total Recoverable	Water	6020A	783458

Analysis Batch: 783828

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	7470A	783678
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	7470A	783678
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	7470A	783678
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	7470A	783678
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	7470A	783678
MB 680-783678/1-A	Method Blank	Total/NA	Water	7470A	783678
LCS 680-783678/2-A	Lab Control Sample	Total/NA	Water	7470A	783678
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	7470A	783678
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	7470A	783678

General Chemistry

Analysis Batch: 616255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	410.4	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	410.4	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	410.4	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	410.4	
MB 280-616255/5	Method Blank	Total/NA	Water	410.4	
LCS 280-616255/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-616255/4	Lab Control Sample Dup	Total/NA	Water	410.4	

Analysis Batch: 616783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	410.4	
MB 280-616783/5	Method Blank	Total/NA	Water	410.4	
LCS 280-616783/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-616783/4	Lab Control Sample Dup	Total/NA	Water	410.4	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	410.4	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	410.4	

Analysis Batch: 783381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	2540C-2011	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	2540C-2011	

General Chemistry (Continued)

Analysis Batch: 783381 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	2540C-2011	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	2540C-2011	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	2540C-2011	
MB 680-783381/1	Method Blank	Total/NA	Water	2540C-2011	
LCS 680-783381/2	Lab Control Sample	Total/NA	Water	2540C-2011	
LCSD 680-783381/3	Lab Control Sample Dup	Total/NA	Water	2540C-2011	
680-236120-2 DU	LFM-99-02B-SPR23	Total/NA	Water	2540C-2011	

Analysis Batch: 783585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	2320B-2011	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	2320B-2011	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	2320B-2011	
MB 680-783585/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-783585/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-783585/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Prep Batch: 783892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	9012B	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	9012B	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	9012B	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	9012B	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	9012B	
MB 680-783892/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-783892/13-A	Lab Control Sample	Total/NA	Water	9012B	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	9012B	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	9012B	

Analysis Batch: 783962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	9012B	783892
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	9012B	783892
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	9012B	783892
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	9012B	783892
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	9012B	783892
MB 680-783892/12-A	Method Blank	Total/NA	Water	9012B	783892
LCS 680-783892/13-A	Lab Control Sample	Total/NA	Water	9012B	783892
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	9012B	783892
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	9012B	783892

Analysis Batch: 784252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	2320B-2011	
MB 680-784252/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-784252/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-784252/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	
680-236120-4 DU	LFM-DUP01-SPR23	Total/NA	Water	2320B-2011	

General Chemistry

Analysis Batch: 784254

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	2320B-2011	
MB 680-784254/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-784254/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-784254/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Analysis Batch: 785197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-236120-1	LFM-03-07-SPR23	Total/NA	Water	353.2-1993 R2.0	
680-236120-2	LFM-99-02B-SPR23	Total/NA	Water	353.2-1993 R2.0	
680-236120-3	LFM-99-05A-SPR23	Total/NA	Water	353.2-1993 R2.0	
680-236120-4	LFM-DUP01-SPR23	Total/NA	Water	353.2-1993 R2.0	
680-236120-5	LFM-99-06A-RP-SPR23	Total/NA	Water	353.2-1993 R2.0	
MB 680-785197/17	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-785197/18	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
680-236120-2 MS	LFM-99-02B-SPR23	Total/NA	Water	353.2-1993 R2.0	
680-236120-2 MSD	LFM-99-02B-SPR23	Total/NA	Water	353.2-1993 R2.0	

Client Sample ID: LFM-03-07-SPR23
Date Collected: 06/08/23 10:40
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236120-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 16:24	X875	ELLE
	Instrument ID: 10149									
Total/NA	Prep	3510C			257.8 mL	1 mL	783438	06/13/23 17:04	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	784780	06/21/23 17:06	JCK	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			1028.2 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391880	06/29/23 00:57	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1028.2 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391881	06/29/23 00:34	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Prep	3510C	RE		1054.2 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394760	07/08/23 00:06	UHEW	ELLE
	Instrument ID: 19875-S									
Total/NA	Prep	3510C	RE		1054.2 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394765	07/08/23 00:06	UHEW	ELLE
	Instrument ID: 19875-T									
Total/NA	Analysis	9056A		1	5 mL	5 mL	783989	06/16/23 19:48	UI	EET SAV
	Instrument ID: CICK									
Total/NA	Analysis	9056A	DL	5	5 mL	5 mL	784086	06/17/23 16:13	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	782980	06/11/23 11:01	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783291	06/12/23 13:17	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	782979	06/11/23 11:01	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783273	06/12/23 13:32	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	783678	06/15/23 04:44	JKL	EET SAV
Total/NA	Analysis	7470A		1			783828	06/15/23 11:24	JKL	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			783585	06/14/23 02:20	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	783381	06/13/23 12:47	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	785197	06/22/23 17:19	NVF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	616255	06/15/23 11:42	BCR	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	783892	06/16/23 05:30	JAS	EET SAV
Total/NA	Analysis	9012B		1			783962	06/16/23 09:15	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-99-02B-SPR23
Date Collected: 06/08/23 10:45
Date Received: 06/10/23 09:32

Lab Sample ID: 680-236120-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 17:05	X875	ELLE
	Instrument ID: 10149									
Total/NA	Prep	3510C			255.6 mL	1 mL	783438	06/13/23 17:04	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	783593	06/14/23 21:12	DBM	EET SAV
	Instrument ID: CSGJ									
Total/NA	Prep	3510C			1035.1 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391880	06/29/23 01:20	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1035.1 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391881	06/29/23 00:57	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Prep	3510C	RE		1043.4 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394760	07/08/23 00:28	UHEW	ELLE
	Instrument ID: 19875-S									
Total/NA	Prep	3510C	RE		1043.4 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394765	07/08/23 00:28	UHEW	ELLE
	Instrument ID: 19875-T									
Total/NA	Analysis	9056A		5	5 mL	5 mL	784086	06/17/23 11:47	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	782980	06/11/23 11:01	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783291	06/12/23 12:56	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	782979	06/11/23 11:01	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783273	06/12/23 12:19	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	783678	06/15/23 04:44	JKL	EET SAV
Total/NA	Analysis	7470A		1			783828	06/15/23 11:26	JKL	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			783585	06/14/23 02:11	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	783381	06/13/23 12:47	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	785197	06/22/23 17:13	NVF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	616783	06/20/23 12:11	BCR	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	783892	06/16/23 05:30	JAS	EET SAV
Total/NA	Analysis	9012B		1			783962	06/16/23 09:15	JAS	EET SAV
	Instrument ID: KONELAB4									

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-05A-SPR23
Lab Sample ID: 680-236120-3

Date Collected: 06/08/23 10:36
Matrix: Water

Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 19:08	X875	ELLE
	Instrument ID: 10149									
Total/NA	Prep	3510C			239 mL	1 mL	783438	06/13/23 17:04	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	784780	06/21/23 17:21	JCK	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			972.4 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391880	06/29/23 02:27	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			972.4 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391881	06/29/23 02:05	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Prep	3510C	RE		1004.7 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394760	07/08/23 01:35	UHEW	ELLE
	Instrument ID: 19875-S									
Total/NA	Prep	3510C	RE		1004.7 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394765	07/08/23 01:35	UHEW	ELLE
	Instrument ID: 19875-T									
Total/NA	Analysis	9056A		2	5 mL	5 mL	784086	06/17/23 12:38	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	783457	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 16:27	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783458	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 18:17	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	783678	06/15/23 04:44	JKL	EET SAV
Total/NA	Analysis	7470A		1			783828	06/15/23 11:30	JKL	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			783585	06/14/23 02:30	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	783381	06/13/23 12:47	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	785197	06/22/23 17:21	NVF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	616255	06/15/23 11:42	BCR	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	783892	06/16/23 05:30	JAS	EET SAV
Total/NA	Analysis	9012B		1			783962	06/16/23 09:15	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-DUP01-SPR23

Lab Sample ID: 680-236120-4

Date Collected: 06/08/23 10:36

Matrix: Water

Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 19:49	X875	ELLE
	Instrument ID: 10149									
Total/NA	Prep	3510C			234.1 mL	1 mL	783438	06/13/23 17:04	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	784780	06/21/23 17:35	JCK	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			1037.5 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391880	06/29/23 02:50	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1037.5 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391881	06/29/23 02:27	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Prep	3510C	RE		1010.1 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394760	07/08/23 01:57	UHEW	ELLE
	Instrument ID: 19875-S									
Total/NA	Prep	3510C	RE		1010.1 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394765	07/08/23 01:57	UHEW	ELLE
	Instrument ID: 19875-T									
Total/NA	Analysis	9056A		2	5 mL	5 mL	784086	06/17/23 12:50	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	783457	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 16:37	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783458	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 18:21	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	783678	06/15/23 04:44	JKL	EET SAV
Total/NA	Analysis	7470A		1			783828	06/15/23 11:32	JKL	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			784252	06/16/23 17:38	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	783381	06/13/23 12:47	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	785197	06/22/23 17:22	NVF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	616255	06/15/23 11:42	BCR	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	783892	06/16/23 05:30	JAS	EET SAV
Total/NA	Analysis	9012B		1			783962	06/16/23 09:15	JAS	EET SAV
	Instrument ID: KONELAB4									

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Client Sample ID: LFM-99-06A-RP-SPR23
Lab Sample ID: 680-236120-5
Date Collected: 06/08/23 13:25
Matrix: Water
Date Received: 06/10/23 09:32

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH		1	5 mL	5 mL	389210	06/21/23 20:30	X875	ELLE
	Instrument ID: 10149									
Total/NA	Prep	3510C			259.8 mL	1 mL	783438	06/13/23 17:04	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	784780	06/21/23 17:50	JCK	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			1044.4 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391880	06/29/23 03:12	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1044.4 mL	1 mL	388980	06/21/23 08:13	A2VL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	391587	06/28/23 07:19	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	391881	06/29/23 02:50	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Prep	3510C	RE		1047.4 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394760	07/08/23 02:20	UHEW	ELLE
	Instrument ID: 19875-S									
Total/NA	Prep	3510C	RE		1047.4 mL	1 mL	392793	06/30/23 14:30	K2IL	ELLE
Total/NA	Cleanup	3630C	RE		1.0 mL	1.0 mL	394479	07/07/23 07:22	YDF5	ELLE
Total/NA	Analysis	MA-EPH	RE	1	1 mL	1 mL	394765	07/08/23 02:20	UHEW	ELLE
	Instrument ID: 19875-T									
Total/NA	Analysis	9056A		5	5 mL	5 mL	784086	06/17/23 13:03	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	783457	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6010C		1			783688	06/14/23 16:39	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	783458	06/14/23 06:46	RR	EET SAV
Total Recoverable	Analysis	6020A		1			783691	06/14/23 18:25	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	783678	06/15/23 04:44	JKL	EET SAV
Total/NA	Analysis	7470A		1			783828	06/15/23 11:33	JKL	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			784254	06/17/23 01:45	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	783381	06/13/23 12:47	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	785197	06/22/23 17:24	NVF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	616255	06/15/23 11:42	BCR	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	783892	06/16/23 05:30	JAS	EET SAV
Total/NA	Analysis	9012B		1			783962	06/16/23 09:15	JAS	EET SAV
	Instrument ID: KONELAB4									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	07-09-23

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-23

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-24
Alaska	State	PA00009	06-30-24
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-23
California	State	2792	11-30-23
Colorado	State	PA00009	06-30-24
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-24
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-23
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-24
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-24
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	06-30-24
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-23
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	9804	08-31-23
Oregon	NELAP	PA200001	09-11-23

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24
Texas	NELAP	T104704194-23-46	08-31-23
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-23
Virginia	NELAP	460182	06-14-24
Washington	State	C457	04-11-24
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-24
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-236120-1
Project/Site: Seres-Arcadis JV, LTM, DCL, Spring 2023

Method	Method Description	Protocol	Laboratory
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	ELLE
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
MA-EPH	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	ELLE
9056A	Anions, Ion Chromatography	SW846	EET SAV
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
7470A	Mercury (CVAA)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
2540C-2011	Total Dissolved Solids (Dried at 180 °C)	SM	EET SAV
353.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAWW	EET SAV
410.4	COD	EPA	EET DEN
9012B	Cyanide, Total and/or Amenable	EPA	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3630C	Silica Gel Cleanup	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE
7470A	Preparation, Mercury	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET SAV

Protocol References:

EPA = US Environmental Protection Agency

MA DEP = Massachusetts Department Of Environmental Protection

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-740763.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-236120-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 6/22/2023			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM, DCL, Spring 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	410.4/ COD	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
LFM-03-07-SPR23 (680-236120-1)	6/8/23	10:40 Eastern		Water			X	1	
LFM-99-02B-SPR23 (680-236120-2)	6/8/23	10:45 Eastern		Water			X	1	
LFM-99-02B-SPR23 (680-236120-2MS)	6/8/23	11:45 Eastern	MS	Water			X	1	
LFM-99-02B-SPR23 (680-236120-2MSD)	6/8/23	12:40 Eastern	MSD	Water			X	1	
LFM-99-05A-SPR23 (680-236120-3)	6/8/23	10:36 Eastern		Water			X	1	
LFM-99-DUP01-SPR23 (680-236120-4)	6/8/23	10:36 Eastern		Water			X	1	
LFM-99-06A-RP-SPR23 (680-236120-5)	6/8/23	13:25 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6/12/25 1500			6/13/23 0915	ETHOEN
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.8 (RTU) C-0.0

Ver: 06/08/2021

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-740766.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-236120-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 6/21/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM, DCL, Spring 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	MAEPH/3510C_14d (MOD) MA EPH	MAVPH/5030C (MOD) MA VPH	MAVPH_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
LFM-03-07-SPR23 (680-236120-1)	6/8/23	10:40 Eastern		Water			X	X	X	5	
LFM-99-02B-SPR23 (680-236120-2)	6/8/23	10:45 Eastern		Water			X	X	X	5	
LFM-99-02B-SPR23 (680-236120-2MS)	6/8/23	11:45 Eastern	MS	Water			X	X	X	5	
LFM-99-02B-SPR23 (680-236120-2MSD)	6/8/23	12:40 Eastern	MSD	Water			X	X	X	5	
LFM-99-05A-SPR23 (680-236120-3)	6/8/23	10:36 Eastern		Water			X	X	X	5	
LFM-99-DUP01-SPR23 (680-236120-4)	6/8/23	10:36 Eastern		Water			X	X	X	5	
LFM-99-06A-RP-SPR23 (680-236120-5)	6/8/23	13:25 Eastern		Water			X	X	X	5	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6/12/23 1300				
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6/13/23 10:05	Company ECLET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.3/2.5 1.6/1.4 0.5/0.6

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236120-1

Login Number: 236120

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236120-1

Login Number: 236120
List Number: 3
Creator: Cannon, Charles D

List Source: Eurofins Denver
List Creation: 06/13/23 03:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-236120-1

Login Number: 236120
List Number: 2
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 06/13/23 12:57 PM

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/31/2024 6:24:12 PM Revision 1

JOB DESCRIPTION

Fort Devens, SRI, AOC43G, Fall 2023

JOB NUMBER

680-242928-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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1/31/2024 6:24:12 PM
Revision 1

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Qualifiers

Metals

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242928-2
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242928-6	AAFES-2-FAL23	Water	11/09/23 09:40	11/14/23 10:05
680-242928-9	AAFES-7-FAL23	Water	11/10/23 10:25	11/14/23 10:05
680-242928-17	XGM-94-04X-FAL23	Water	11/09/23 11:00	11/14/23 10:05

Job Narrative
680-242928-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/14/2023 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 1.1°C, 1.9°C, 2.7°C, 3.3°C and 5.7°C

Revision
The report being provided is a revision of the original report sent on 1/30/2024. The report (revision 1) is being revised due to: Case Narrative required updates.

Subcontract Work
Method MAVPH: This method was subcontracted to Katahdin Analytical Services. The subcontract laboratory certification is different from that of the facility issuing the final report. The subcontract report is appended in its entirety.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Client Sample ID: AAFES-2-FAL23

Date Collected: 11/09/23 09:40
Date Received: 11/14/23 10:05

Lab Sample ID: 680-242928-6

Matrix: Water

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	16000		100	50	20	ug/L		11/15/23 17:25	1
Manganese	4400		10	5.0	1.3	ug/L		11/15/23 17:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	160		5.5	5.0	2.2	mg/L		11/21/23 13:15	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-242928-2
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Client Sample ID: AAFES-7-FAL23
Lab Sample ID: 680-242928-9

Date Collected: 11/10/23 10:25
Matrix: Water
Date Received: 11/14/23 10:05

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	160		10	5.0	1.3	ug/L		11/15/23 17:30	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Client Sample ID: XGM-94-04X-FAL23

Lab Sample ID: 680-242928-17

Date Collected: 11/09/23 11:00

Matrix: Water

Date Received: 11/14/23 10:05

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	200		100	50	20	ug/L		11/15/23 16:45	1
Manganese	440		10	5.0	1.3	ug/L		11/15/23 16:45	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	160		5.5	5.0	2.2	mg/L		11/21/23 13:05	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-808277/1-A
Matrix: Water
Analysis Batch: 808561

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808277

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/15/23 16:41	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/15/23 16:41	1

Lab Sample ID: LCS 680-808277/2-A
Matrix: Water
Analysis Batch: 808561

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808277

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	4930		ug/L		99	87 - 115
Manganese	400	399		ug/L		100	90 - 114

Lab Sample ID: 680-242928-17 MS
Matrix: Water
Analysis Batch: 808561

Client Sample ID: XGM-94-04X-FAL23
Prep Type: Total Recoverable
Prep Batch: 808277

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	200		4990	4980		ug/L		96	87 - 115
Manganese	440		400	858		ug/L		104	90 - 114

Lab Sample ID: 680-242928-17 MSD
Matrix: Water
Analysis Batch: 808561

Client Sample ID: XGM-94-04X-FAL23
Prep Type: Total Recoverable
Prep Batch: 808277

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	200		4990	5010		ug/L		96	87 - 115	1	20
Manganese	440		400	869		ug/L		106	90 - 114	1	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-809458/4
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	5.0	U	5.5	5.0	2.2	mg/L		11/21/23 12:00	1

Lab Sample ID: LCS 680-809458/6
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	250	240		mg/L		96	90 - 112

Lab Sample ID: LCSD 680-809458/19
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Alkalinity as CaCO3 to pH 4.5	250	244		mg/L		98	90 - 112	2	30

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Metals

Prep Batch: 808277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242928-6	AAFES-2-FAL23	Total Recoverable	Water	3005A	
680-242928-9	AAFES-7-FAL23	Total Recoverable	Water	3005A	
680-242928-17	XGM-94-04X-FAL23	Total Recoverable	Water	3005A	
MB 680-808277/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808277/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-242928-17 MS	XGM-94-04X-FAL23	Total Recoverable	Water	3005A	
680-242928-17 MSD	XGM-94-04X-FAL23	Total Recoverable	Water	3005A	

Analysis Batch: 808561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242928-6	AAFES-2-FAL23	Total Recoverable	Water	6010C	808277
680-242928-9	AAFES-7-FAL23	Total Recoverable	Water	6010C	808277
680-242928-17	XGM-94-04X-FAL23	Total Recoverable	Water	6010C	808277
MB 680-808277/1-A	Method Blank	Total Recoverable	Water	6010C	808277
LCS 680-808277/2-A	Lab Control Sample	Total Recoverable	Water	6010C	808277
680-242928-17 MS	XGM-94-04X-FAL23	Total Recoverable	Water	6010C	808277
680-242928-17 MSD	XGM-94-04X-FAL23	Total Recoverable	Water	6010C	808277

General Chemistry

Analysis Batch: 809458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242928-6	AAFES-2-FAL23	Total/NA	Water	2320B-2011	
680-242928-17	XGM-94-04X-FAL23	Total/NA	Water	2320B-2011	
MB 680-809458/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-809458/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-809458/19	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Client Sample ID: AAFES-2-FAL23

Lab Sample ID: 680-242928-6

Date Collected: 11/09/23 09:40
Matrix: Water
Date Received: 11/14/23 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	808277	11/15/23 06:53	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808561	11/15/23 17:25	BJB	EET SAV
	Instrument ID: ICPH									
Total/NA	Analysis	2320B-2011		1			809458	11/21/23 13:15	AS	EET SAV
	Instrument ID: MANTECH 2									

Client Sample ID: AAFES-7-FAL23

Lab Sample ID: 680-242928-9

Date Collected: 11/10/23 10:25
Matrix: Water
Date Received: 11/14/23 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	808277	11/15/23 06:53	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808561	11/15/23 17:30	BJB	EET SAV
	Instrument ID: ICPH									

Client Sample ID: XGM-94-04X-FAL23

Lab Sample ID: 680-242928-17

Date Collected: 11/09/23 11:00
Matrix: Water
Date Received: 11/14/23 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	808277	11/15/23 06:53	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808561	11/15/23 16:45	BJB	EET SAV
	Instrument ID: ICPH									
Total/NA	Analysis	2320B-2011		1			809458	11/21/23 13:05	AS	EET SAV
	Instrument ID: MANTECH 2									

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242928-2
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC43G, Fall 2023

Job ID: 680-242928-2

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.	Project #:
Project Location: Fort Devens	RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SQ6350-2 and -9

Matrices: X Groundwater/Surface Water Soil/Sediment Drinking Water Air Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A	7470/7471 Hg CAM III B	MassDEP VPH CAM IV A **X**	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	X Yes No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	X Yes No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes No Yes No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes No[1]

***Data User Note**: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	X Yes No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes No[1]

[1]*All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Q.A. Officer

Printed Name: Jennifer Prescott

Date: 01/24/2024

REISSUE

TEST AMERICA SAVANNAH

FORT DEVENS - LTM

SQ6350

Jennifer Prescott
207-874-2400

KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074

SAMPLE DATA PACKAGE

NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
FORT DEVENS - LTM
SQ6350

Sample Receipt

The following samples were received on November 16, 2023 and were logged in under Katahdin Analytical Services work order number SQ6350 for a hardcopy due date of December 07, 2023.

KATAHDIN	TEST AMERICA SAVANNAH
Sample No.	Sample Identification
SQ6350-2	AAFES-2-FAL23
SQ6350-9	XGM-94-04X-FAL23

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be "^" flagged and the following language will be included in the case narrative for all DoD compliant work: "^" Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Heather Manz**. This narrative is an integral part of the Report of Analysis.

Reissue 01/24/2024

This report is being reissued to correct the client sample IDs for Katahdin Sample numbers SQ6350-2 and -9 and to move these sample to a separate report.

Organics Analysis

The samples of Work Order SQ6350 were analyzed in accordance with Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MADEP, May 2004, Revision 1.1 and/or for the specific methods listed below or on the Report of Analysis.

MA VPH Analysis

Samples SQ6350-2, 2DL and 9 were manually integrated for the surrogate 2,5-dibromotoluene on the PID and FID, the target analytes benzene, toluene, ethylbenzene, naphthalene, and/or the C9-C10 aromatic, C5-C8 aliphatic, and C9-C12 aliphatic ranges. The specific reason for the manual integration is indicated on the raw data by the manual integration codes (M1-M11). These codes are further explained in the attachment following this narrative.

The independent check standard (file 2QI10012), associated with the initial calibration analyzed on the GC02 instrument on 9/8/23 had a high concentration for the target analyte naphthalene on the PID, which exceeded the laboratory acceptance limit of ±20% of the expected value from the ICAL.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

01/24/2024

Jennifer Prescott
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

Katahdin Analytical Services, LLC — **Sample Receipt Condition Report**

Client: Eurofins Savannah	KAS PM: HHM	Sampled By: Client
Project:	KIMS Entry By: JCB	Delivered By: FedEx
KAS Work Order#: SQ6349, 6350, 6351 (JCB 11/16)	KIMS Review By: HHM	Received By: EP
	Labeled By: EP	
SDG #:	Cooler: 1 of 1	Date/Time Rec.: 11-16-23 0945

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	✓				
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	✓				Temp (°C): 1.4° — Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	✓				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles:					
Aqueous: No bubble larger than a pea?	✓				
Soil/Sediment:					
Received in airtight container?				✓	
Received in methanol?				✓	
Methanol covering soil?				✓	
D.I. Water - Received within 48 hour HT?				✓	
7. Trip Blank present in cooler?				✓	
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved?					
Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2				✓	
Sulfide - >9				✓	
Cyanide – pH >12				✓	
11. Bottleware Prepped on:					

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

QA-048 – Revision 8 – 09/11/2020

REISSUE

SQ 6350

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756344.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 2
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242928-1
Address: 600 Technology Way, ,	Due Date Requested: 11/28/2023			
City: Scarborough	TAT Requested (days):			
State, Zip: ME, 04074				
Phone:	PO #:			
Email:	WO #:			
Project Name: Fort Devens, Long Term Monitoring	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (MAVPH)/ MAVPH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
43GPZ-19-03-FAL23 (680-242928-2)	11/10/23	09:03 Eastern		Water			X	3	
AAFES-2-FAL23-SRI (680-242928-6)	11/9/23	09:40 Eastern		Water			X	3	
AAFES-5-FA23 (680-242928-7)	11/9/23	14:50 Eastern		Water			X	3	
AAFES-6R-FAL23 (680-242928-8)	11/10/23	12:25 Eastern		Water			X	3	
AOC43G-DUP02-FAL23 (680-242928-10)	11/10/23	09:40 Eastern		Water			X	3	
XGM-23-01-FAL23 (680-242928-14)	11/10/23	12:25 Eastern		Water			X	3	
XGM-23-02-FAL23 (680-242928-15)	11/10/23	12:00 Eastern		Water			X	3	
XGM-23-03-FAL23 (680-242928-16)	11/9/23	13:45 Eastern		Water			X	3	
XGM-94-04X-FAL23-SRI (680-242928-17)	11/9/23	11:00 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11/15/23 1609			11-16-23 0945	Katahdin
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

REISSUE

SQ 6349 6350 JOB 4/16

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756344.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 2 of 2
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242928-1
Address: 600 Technology Way, ,	Due Date Requested: 11/28/2023			
City: Scarborough	TAT Requested (days):			
State, Zip: ME, 04074				
Phone:	PO #:			
Email:	WO #:			
Project Name: Fort Devens, Long Term Monitoring	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (MAVPH)/ MAVPH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
XGM-94-07X-FAL23 (680-242928-19)	11/10/23	09:45 Eastern		Water			X	3	
XGM-94-08X-FAL23 (680-242928-20)	11/9/23	10:05 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	11/13/23 1609			11-16-23 0945	Katahdin
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Katahdin ANALYTICAL SERVICES

Katahdin Analytical Services

Login Chain of Custody (ln01)

Jan. 12, 2024
04:51 PM

Login Number: SQ6350

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Primary Report Address:
Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:
Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah,GA 31404

email project manager and
beth.daughtry@et.eurofinsus.com

Report CC Addresses:
Invoice CC Addresses:

Quote/Incoming: TASAV-DEVENS

Login Information

ANALYSIS INSTRUCTIONS	:	FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.
CHECK NO.	:	
CLIENT PO#	:	US1672979726
CLIENT PROJECT MANAGE	:	Jerry Lanier
CONTRACT	:	68023801, 680-242928
COOLER TEMPERATURE	:	1.4
DELIVERY SERVICES	:	FedEx
EDD FORMAT	:	ECC-091317-TXT
ISM INSTRUCTIONS	:	
LOGIN INITIALS	:	JCB
PM	:	HHM
PROJECT NAME	:	Fort Devens - LTM
QC LEVEL	:	IV
REPORT INSTRUCTIONS	:	SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinsus.com. No HC.
SDG ID	:	
SDG STATUS	:	
TEMPLATE	:	
VERBAL TAT	:	

Run Reports: Logindetail

Login Number: SQ6350

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SQ6350-1	43GPZ-19-03-FAL23	10-NOV-23 09:03	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		
Service	S REPORTING						
SQ6350-2	AAFES-2-FAL23	09-NOV-23 09:40	16-NOV-23		07-DEC-23		
Sample Comments:	vial "A" fell and broke						
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	23-NOV-23			40mL Vial+HCl		
SQ6350-3	AAFES-5-FAL23	09-NOV-23 14:50	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	23-NOV-23			40mL Vial+HCl		
SQ6350-4	AAFES-6R-FAL23	10-NOV-23 12:25	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		
SQ6350-5	AOC43G-DUP02-FAL23	10-NOV-23 09:40	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		
SQ6350-6	XGM-23-01-FAL23	10-NOV-23 12:25	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		
SQ6350-7	XGM-23-02-FAL23	10-NOV-23 12:00	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		
SQ6350-8	XGM-23-03-FAL23	09-NOV-23 13:45	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	23-NOV-23			40mL Vial+HCl		
SQ6350-9	XGM-94-04X-FAL23	09-NOV-23 11:00	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	23-NOV-23			40mL Vial+HCl		
SQ6350-10	XGM-94-07X-FAL23	10-NOV-23 09:45	16-NOV-23		07-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	24-NOV-23			40mL Vial+HCl		

Run Reports: Logindetail

Login Number: SQ6350

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SQ6350-11	XGM-94-08X-FAL23	09-NOV-23 10:05	16-NOV-23		07-DEC-23		

Sample Comments:

Matrix		*Product*	*Hold Date (shortest)*	*Notes*	*Bottle Type*
Aqueous	S	MA-VPH-LOD	23-NOV-23		40mL Vial+HCl

Total Samples: 11 ***Total Analyses: 12***

Run Reports: Logindetail

SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL, "U" LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), but above the Method Detection Limit (MDL).

And/or

J Used for Dual Column analytes when there is a greater than 40% difference for detected concentrations between the two GC/HPLC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

I Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration (ICAL).

D Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration Verification (ICV).

C Indicates that the flagged compound did not meet DoD criteria in the corresponding opening Calibration Verification (CV).

V Indicates that the flagged compound did not meet DoD criteria in the corresponding closing Calibration Verification (CV).

L/LL Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M/MM Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike (MS) and/or Matrix Spike Duplicate MSD) prepared and/or analyzed concurrently with the native sample.

H Indicates the flagged compound was detected on the primary column but was not detected on the confirmation column therefore the compound is not reported as a positive detection. (SW846 8330A/B only)

Report of Analytical Results

SDG: SQ6350
Lab ID: SQ6350-2
Client ID: AAFES-2-FAL23
Matrix: AQ
Lab File ID: 2QK10055.D

Sample Date: 09-NOV-23
Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 23-JAN-24
Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics		510	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	E	400	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	E	500	ug/L	1	100	100	50.	75.
Benzene	J	1.5	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	J	1.3	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	J	2.7	ug/L	1	5	5.0	1.6	3.8
Toluene	J	1.3	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		86.6	%					
2,5-Dibromotoluene (PID)		90.4	%					

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Report of Analytical Results

SDG: SQ6350
Lab ID: SQ6350-2DL
Client ID: AAFES-2-FAL23
Matrix: AQ
Lab File ID: 2QK10073.D

Sample Date: 09-NOV-23
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631

Report Date: 23-JAN-24
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics		300	ug/L	2	100	200	100	150
C9-C12 Aliphatics		320	ug/L	2	100	200	100	150
C9-C10 Aromatics		430	ug/L	2	100	200	100	150
Benzene	U	4.0	ug/L	2	3	6.0	0.62	4.0
Ethylbenzene	J	1.8	ug/L	2	5	10.	0.84	7.6
Methyl tert-butylether	U	7.6	ug/L	2	5	10.	0.62	7.6
Naphthalene	U	7.6	ug/L	2	5	10.	3.2	7.6
Toluene	J	1.0	ug/L	2	5	10.	0.68	7.6
m+p-Xylenes	U	15	ug/L	2	10	20.	1.8	15.
o-Xylene	J	1.3	ug/L	2	5	10.	0.94	7.6
2,5-Dibromotoluene (FID)		84.0	%					
2,5-Dibromotoluene (PID)		79.3	%					

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Report of Analytical Results

SDG: SQ6350
Lab ID: SQ6350-9
Client ID: XGM-94-04X-FAL23
Matrix: AQ
Lab File ID: 2QK10062.D

Sample Date: 09-NOV-23
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 23-JAN-24
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	J	52	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	J	62	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	J	1.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		102.	%					
2,5-Dibromotoluene (PID)		102.	%					

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Report of Analytical Results

SDG: SQ6350
Lab ID: WG345564-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QK10051.D

Sample Date: N/A
Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 04-DEC-23
Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		89.9	%					
2,5-Dibromotoluene (PID)		92.5	%					

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Report of Analytical Results

SDG: SQ6350
Lab ID: WG345631-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QK10070.D

Sample Date: N/A
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631

Report Date: 04-DEC-23
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		83.8	%					
2,5-Dibromotoluene (PID)		89.2	%					

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Form 2
System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SQ6350 **Matrix:** AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
AAFES-2-FAL23	SQ6350-2	B	86.6	90.4
AAFES-2-FAL23	SQ6350-2DL	B	84.0	79.3
XGM-94-04X-FAL23	SQ6350-9	B	102.	102.
Method Blank	WG345564-1	B	89.9	92.5
Laboratory Control S	WG345564-2	B	110.	115.
Laboratory Control S	WG345564-3	B	110.	112.
Method Blank	WG345631-1	B	83.8	89.2
Laboratory Control S	WG345631-2	B	112.	111.
Laboratory Control S	WG345631-3	B	115.	107.

Abbr.	Surrogate Compound	QC Limits
DBT-FID	2,5-Dibromotoluene (FID)	70-130
DBT-PID	2,5-Dibromotoluene (PID)	70-130

= Column to be used to flag recovery limits.
* = Values outside of contract required QC limits.
D= System Monitoring Compound diluted out.

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LCS/LCSD Recovery Report

LCS ID: WG345564-2
LCSD ID: WG345564-3
SDG: SQ6350
LCS File ID: 2QK10052.D

Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564
LCSD File ID: 2QK10053.D

Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 04-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	289.	96.3	289.	96.3	ug/L	0	25	70-130
Unadjusted C9-C12 Aliphatics	200.	232.	116.	232.	116.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	112.	112.	113.	113.	ug/L	1	25	70-130
Benzene	100.	98.7	98.7	100.	100.	ug/L	1	25	70-130
Ethylbenzene	100.	103.	103.	104.	104.	ug/L	1	25	70-130
Methyl tert-butylether	100.	96.4	96.4	96.3	96.3	ug/L	0	25	70-130
Naphthalene	100.	109.	109.	109.	109.	ug/L	0	25	70-130
Toluene	100.	101.	101.	103.	103.	ug/L	2	25	70-130
m+p-Xylenes	200.	202.	101.	205.	102.	ug/L	1	25	70-130
o-Xylene	100.	105.	105.	106.	106.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			110.		110.				70-130
2,5-Dibromotoluene (PID)			115.		112.				70-130

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LCS/LCSD Recovery Report

LCS ID: WG345631-2
LCSD ID: WG345631-3
SDG: SQ6350
LCS File ID: 2QK10071.D

Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631
LCSD File ID: 2QK10072.D

Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 04-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	279.	93.0	270.	90.0	ug/L	3	25	70-130
Unadjusted C9-C12 Aliphatics	200.	228.	114.	227.	114.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	110.	110.	110.	110.	ug/L	0	25	70-130
Benzene	100.	98.3	98.3	97.2	97.2	ug/L	1	25	70-130
Ethylbenzene	100.	102.	102.	102.	102.	ug/L	0	25	70-130
Methyl tert-butylether	100.	95.2	95.2	95.7	95.7	ug/L	0	25	70-130
Naphthalene	100.	107.	107.	105.	105.	ug/L	2	25	70-130
Toluene	100.	100.	100.	100.	100.	ug/L	0	25	70-130
m+p-Xylenes	200.	200.	100.	197.	98.5	ug/L	2	25	70-130
o-Xylene	100.	104.	104.	103.	103.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			112.		115.				70-130
2,5-Dibromotoluene (PID)			111.		107.				70-130

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Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
SDG : SQ6350
Lab Sample ID : WG345564-1
Date Analyzed : 16-NOV-23
Lab File ID : 2QK10051.D
Time Analyzed : 17:01
Instrument ID : GC02
Date Extracted : 16-NOV-23

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG345564-2	2QK10052.D	11/16/23	17:43
Laboratory Control S	WG345564-3	2QK10053.D	11/16/23	18:24
AAFES-2-FAL23	SQ6350-2	2QK10055.D	11/16/23	21:53
XGM-94-04X-FAL23	SQ6350-9	2QK10062.D	11/17/23	02:49

Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
SDG : SQ6350
Lab Sample ID : WG345631-1
Date Analyzed : 17-NOV-23
Lab File ID : 2QK10070.D
Time Analyzed : 14:18
Instrument ID : GC02
Date Extracted : 17-NOV-23

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG345631-2	2QK10071.D	11/17/23	14:59
Laboratory Control S	WG345631-3	2QK10072.D	11/17/23	15:40
AAFES-2-FAL23	SQ6350-2DL	2QK10073.D	11/17/23	17:47

Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6350

Instrument ID: GC02 **Column ID:** A

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C9-C10 Aromatic	967	830	925	1037	1086	770	AVG		936		12.8704	25	O
Methyl tert-butylether	643	650	664	672	675	484	AVG		631		11.5901	25	O
Benzene	1284	1153	1230	1239	1246	873	AVG		1171		12.9925	25	O
Toluene	1077	998	1087	1130	1135	790	AVG		1036		12.5836	25	O
Ethylbenzene	1031	825	912	984	1004	700	AVG		909		13.9320	25	O
m+p-Xylene	1280	1073	1172	1224	1227	847	AVG		1137		13.9357	25	O
o-Xylene	980	914	1008	1056	1063	743	AVG		961		12.4781	25	O
1,2,4-trimethylbenzene	967	830	925	1037	1086	770	AVG		936		12.8704	25	O
Naphthalene	1131	931	965	1148	1264	1053	AVG		1082		11.4766	25	O
2,5-Dibromotoluene (PID)	868	610	669	803	920	714	AVG		764		15.6928	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6350

Instrument ID: GC02 **Column ID:** B

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C5-C8 Aliphatic	1368	1462	1510	1515	1550	1110	AVG		1419		11.55808	25	O
C9-C12 Aliphatic	1382	987	1139	1412	1613	1351	AVG		1314		16.76788	25	O
n-Pentane	1678	1360	1331	1423	1436	1022	AVG		1375		15.42459	25	O
2-Methylpentane	1325	1489	1568	1504	1565	1104	AVG		1426		12.68114	25	O
Methyl tert-butylether	1263	1466	1350	1342	1364	980	AVG		1294		12.92115	25	O
2,2,4-Trimethylpentane	1102	1535	1630	1619	1650	1205	AVG		1457		16.50443	25	O
Benzene	2236	1912	2014	2062	2078	1440	AVG		1957		14.02254	25	O
Toluene	2246	1805	1973	2008	2022	1402	AVG		1909		14.97234	25	O
n-Nonane	1233	1074	1149	1315	1445	1251	AVG		1244		10.38257	25	O
n-Decane	1302	833	875	1165	1553	1352	AVG		1180		23.90207	25	O
Ethylbenzene	1982	1598	1747	1898	1949	1366	AVG		1757		13.60981	25	O
m+p-Xylene	2144	1814	1973	2094	2091	1446	AVG		1927		13.69605	25	O
o-Xylene	2030	1823	2010	2129	2137	1484	AVG		1935		12.83633	25	O
1,2,4-trimethylbenzene	1886	1537	1710	1887	1985	1413	AVG		1736		12.94449	25	O
n-Butylcyclohexane	1461	1141	1402	1660	1673	1350	AVG		1448		13.85802	25	O
Naphthalene	1511	1246	1284	1588	1686	1382	AVG		1450		12.03582	25	O
2,5-Dibromotoluene (FID)	653	397	443	529	572	438	AVG		505		19.17753	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345564-4
Analytical Date: 11/16/23 14:28
Lab File ID: 2QK10050.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	998	998	0.100	6.60402	25.000	Averaged	
Methyl tert-butylether	631	634	634	0.100	0.47833	25.000	Averaged	
Benzene	1171	1167	1167	0.100	-0.35408	25.000	Averaged	
Toluene	1036	1066	1066	0.100	2.83514	25.000	Averaged	
Ethylbenzene	909	930	930	0.100	2.31487	25.000	Averaged	
m+p-Xylene	1137	1158	1158	0.100	1.86422	25.000	Averaged	
o-Xylene	961	1009	1009	0.100	5.04246	25.000	Averaged	
1,2,4-trimethylbenzene	936	998	998	0.100	6.60272	25.000	Averaged	
Naphthalene	1082	1075	1075	0.100	-0.60736	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	738	738	0.100	-3.38657	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345564-4
Analytical Date: 11/16/23 14:28
Lab File ID: 2QK10050.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1465	1465	0.100	3.21119	25.000	Averaged	
C9-C12 Aliphatic	1314	1310	1310	0.100	-0.26845	25.000	Averaged	
n-Pentane	1375	1337	1337	0.100	-2.72731	25.000	Averaged	
2-Methylpentane	1426	1466	1466	0.100	2.82124	25.000	Averaged	
Methyl tert-butylether	1294	1382	1382	0.100	6.79350	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1591	1591	0.100	9.19703	25.000	Averaged	
Benzene	1957	2098	2098	0.100	7.19890	25.000	Averaged	
Toluene	1909	2049	2049	0.100	7.30622	25.000	Averaged	
n-Nonane	1244	1286	1286	0.100	3.35508	30.000	Averaged	
n-Decane	1180	1039	1039	0.100	-11.99269	25.000	Averaged	
Ethylbenzene	1757	1940	1940	0.100	10.43258	25.000	Averaged	
m+p-Xylene	1927	2106	2106	0.100	9.28072	25.000	Averaged	
o-Xylene	1935	2162	2162	0.100	11.72170	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1962	1962	0.100	12.98448	25.000	Averaged	
n-Butylcyclohexane	1448	1582	1582	0.100	9.28741	25.000	Averaged	
Naphthalene	1450	1551	1551	0.100	6.97204	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	499	499	0.100	-1.34508	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345564-5
Analytical Date: 11/17/23 06:20
Lab File ID: 2QK10067.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1007	1007	0.100	7.62309	25.000	Averaged	
Methyl tert-butylether	631	656	656	0.100	3.89383	25.000	Averaged	
Benzene	1171	1200	1200	0.100	2.51745	25.000	Averaged	
Toluene	1036	1097	1097	0.100	5.90807	25.000	Averaged	
Ethylbenzene	909	949	949	0.100	4.40221	25.000	Averaged	
m+p-Xylene	1137	1180	1180	0.100	3.74619	25.000	Averaged	
o-Xylene	961	1030	1030	0.100	7.17216	25.000	Averaged	
1,2,4-trimethylbenzene	936	1007	1007	0.100	7.62218	25.000	Averaged	
Naphthalene	1082	1127	1127	0.100	4.21040	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	786	786	0.100	2.83321	25.000	Averaged	

*** = Compound out of QC criteria**

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REISSUE

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345564-5
Analytical Date: 11/17/23 06:20
Lab File ID: 2QK10067.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1431	1431	0.100	0.84261	25.000	Averaged	
C9-C12 Aliphatic	1314	1162	1162	0.100	-11.56995	25.000	Averaged	
n-Pentane	1375	1316	1316	0.100	-4.30261	25.000	Averaged	
2-Methylpentane	1426	1451	1451	0.100	1.76376	25.000	Averaged	
Methyl tert-butylether	1294	1476	1476	0.100	14.05257	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1527	1527	0.100	4.79708	25.000	Averaged	
Benzene	1957	2156	2156	0.100	10.16816	25.000	Averaged	
Toluene	1909	2104	2104	0.100	10.19962	25.000	Averaged	
n-Nonane	1244	1128	1128	0.100	-9.31881	30.000	Averaged	
n-Decane	1180	909	909	0.100	-22.98068	25.000	Averaged	
Ethylbenzene	1757	1978	1978	0.100	12.61623	25.000	Averaged	
m+p-Xylene	1927	2158	2158	0.100	11.98575	25.000	Averaged	
o-Xylene	1935	2208	2208	0.100	14.10882	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1977	1977	0.100	13.88641	25.000	Averaged	
n-Butylcyclohexane	1448	1415	1415	0.100	-2.26961	25.000	Averaged	
Naphthalene	1450	1682	1682	0.100	16.03228	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	545	545	0.100	7.80993	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345631-4
Analytical Date: 11/17/23 12:53
Lab File ID: 2QK10069.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	998	998	0.100	6.66963	25.000	Averaged	
Methyl tert-butylether	631	639	639	0.100	1.23241	25.000	Averaged	
Benzene	1171	1161	1161	0.100	-0.80505	25.000	Averaged	
Toluene	1036	1046	1046	0.100	0.90490	25.000	Averaged	
Ethylbenzene	909	916	916	0.100	0.74221	25.000	Averaged	
m+p-Xylene	1137	1142	1142	0.100	0.38854	25.000	Averaged	
o-Xylene	961	998	998	0.100	3.91828	25.000	Averaged	
1,2,4-trimethylbenzene	936	998	998	0.100	6.66898	25.000	Averaged	
Naphthalene	1082	1088	1088	0.100	0.60171	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	761	761	0.100	-0.33165	25.000	Averaged	

*** = Compound out of QC criteria**

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
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http://katahdinlab.com
sales@katahdinlab.com

REISSUE

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345631-4
Analytical Date: 11/17/23 12:53
Lab File ID: 2QK10069.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1546	1546	0.100	8.92253	25.000	Averaged	
C9-C12 Aliphatic	1314	1377	1377	0.100	4.79435	25.000	Averaged	
n-Pentane	1375	1422	1422	0.100	3.40514	25.000	Averaged	
2-Methylpentane	1426	1546	1546	0.100	8.40177	25.000	Averaged	
Methyl tert-butylether	1294	1411	1411	0.100	9.01279	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1670	1670	0.100	14.63897	25.000	Averaged	
Benzene	1957	2104	2104	0.100	7.55051	25.000	Averaged	
Toluene	1909	2023	2023	0.100	5.96218	25.000	Averaged	
n-Nonane	1244	1303	1303	0.100	4.70508	30.000	Averaged	
n-Decane	1180	1092	1092	0.100	-7.41817	25.000	Averaged	
Ethylbenzene	1757	1926	1926	0.100	9.63222	25.000	Averaged	
m+p-Xylene	1927	2096	2096	0.100	8.77003	25.000	Averaged	
o-Xylene	1935	2156	2156	0.100	11.40445	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1983	1983	0.100	14.20433	25.000	Averaged	
n-Butylcyclohexane	1448	1661	1661	0.100	14.74819	25.000	Averaged	
Naphthalene	1450	1617	1617	0.100	11.57873	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	513	513	0.100	1.53243	25.000	Averaged	

*** = Compound out of QC criteria**

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REISSUE

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345631-5
Analytical Date: 11/18/23 00:09
Lab File ID: 2QK10082.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	978	978	0.100	4.51053	25.000	Averaged	
Methyl tert-butylether	631	642	642	0.100	1.66647	25.000	Averaged	
Benzene	1171	1166	1166	0.100	-0.44290	25.000	Averaged	
Toluene	1036	1062	1062	0.100	2.47804	25.000	Averaged	
Ethylbenzene	909	917	917	0.100	0.86319	25.000	Averaged	
m+p-Xylene	1137	1140	1140	0.100	0.27773	25.000	Averaged	
o-Xylene	961	999	999	0.100	3.99114	25.000	Averaged	
1,2,4-trimethylbenzene	936	978	978	0.100	4.51038	25.000	Averaged	
Naphthalene	1082	1108	1108	0.100	2.45227	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	774	774	0.100	1.36203	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6350
Lab ID: WG345631-5
Analytical Date: 11/18/23 00:09
Lab File ID: 2QK10082.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1485	1485	0.100	4.63327	25.000	Averaged	
C9-C12 Aliphatic	1314	1249	1249	0.100	-4.95680	25.000	Averaged	
n-Pentane	1375	1368	1368	0.100	-0.52801	25.000	Averaged	
2-Methylpentane	1426	1498	1498	0.100	5.06523	25.000	Averaged	
Methyl tert-butylether	1294	1436	1436	0.100	10.96163	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1589	1589	0.100	9.08172	25.000	Averaged	
Benzene	1957	2146	2146	0.100	9.68674	25.000	Averaged	
Toluene	1909	2086	2086	0.100	9.27776	25.000	Averaged	
n-Nonane	1244	1214	1214	0.100	-2.42901	30.000	Averaged	
n-Decane	1180	997	997	0.100	-15.47739	25.000	Averaged	
Ethylbenzene	1757	1966	1966	0.100	11.89215	25.000	Averaged	
m+p-Xylene	1927	2158	2158	0.100	12.00547	25.000	Averaged	
o-Xylene	1935	2223	2223	0.100	14.85803	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1957	1957	0.100	12.71609	25.000	Averaged	
n-Butylcyclohexane	1448	1500	1500	0.100	3.61803	25.000	Averaged	
Naphthalene	1450	1677	1677	0.100	15.68874	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	565	565	0.100	11.74030	25.000	Averaged	

*** = Compound out of QC criteria**

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REISSUE

Form 8
GC Analytical Sequence

Lab Name : Katahdin Analytical Services **SDG :** SQ6350
Instrument ID : GC02

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG342400-4	09/08/23	11:40		31.608
Initial Calibration	WG342400-4	09/08/23	11:40	31.597	
Initial Calibration	WG342400-1	09/08/23	12:21		31.591
Initial Calibration	WG342400-1	09/08/23	12:21	31.577	
Initial Calibration	WG342400-2	09/08/23	13:02		31.599
Initial Calibration	WG342400-2	09/08/23	13:02	31.589	
Initial Calibration	WG342400-3	09/08/23	13:43		31.593
Initial Calibration	WG342400-3	09/08/23	13:43	31.583	
Initial Calibration	WG342400-5	09/08/23	14:25		31.599
Initial Calibration	WG342400-5	09/08/23	14:25	31.588	
Initial Calibration	WG342400-6	09/08/23	15:06		31.597
Initial Calibration	WG342400-6	09/08/23	15:06	31.587	
Independent Source	WG342400-7	09/08/23	17:40	31.599	31.612
Continuing Calibrati	WG345564-4	11/16/23	14:28	31.497	31.507
Method Blank	WG345564-1	11/16/23	17:01	31.523	31.534
Laboratory Control S	WG345564-2	11/16/23	17:43	31.512	31.522
Laboratory Control S	WG345564-3	11/16/23	18:24	31.504	31.514
AAFES-2-FAL23	SQ6350-2	11/16/23	21:53	31.462	31.474
XGM-94-04X-FAL23	SQ6350-9	11/17/23	02:49	31.443	31.453
Continuing Calibrati	WG345564-5	11/17/23	06:20	31.442	31.452
Continuing Calibrati	WG345631-4	11/17/23	12:53	31.5	31.51
Method Blank	WG345631-1	11/17/23	14:18	31.517	31.528
Laboratory Control S	WG345631-2	11/17/23	14:59	31.513	31.523
Laboratory Control S	WG345631-3	11/17/23	15:40	31.51	31.52
AAFES-2-FAL23	SQ6350-2DL	11/17/23	17:47	31.522	31.531
Continuing Calibrati	WG345631-5	11/18/23	00:09	31.469	31.479

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # 43G-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

		Analytical Test Method	MADEPEP (A)	MADEPVP (A)	SW6010C - Al	SW6010C - Al Fe	SW6010C (L)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9056A - SO4	SW9060A - TOC					
	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023		2	4	9	9	9	9	9	9	5	10					
	Sample ID	Matrix	Date	Time	Samp Init.										Location ID	Sample Type	Depth (ft bgs) Top - Bottom		Cooler	Comments
1	43GPZ-19-01-FAL23	WG								X	X	X	X	X	X	43GPZ-19-01	N1	9.83	19.83	1	
2	43GPZ-19-02-FAL23	WG	11-9-23	1250	AF					X	X	X	X	[redacted]		43GPZ-19-02	N1	19.33	29.33	1	Metals only DC
3	43GPZ-19-03-FAL23	WG	11-10-23	0903	MS	X	X			X	X	X	X	X	X	43GPZ-19-03	N1	15.00	25.00	1	
4	43GPZ-19-04-FAL23	WG	11-9-23	0925	MS					X	X	X	X	X	X	43GPZ-19-04	N1	2.00	12.00	1	
5	43GPZ-19-05-FAL23	WG	11-9-23	1046	MS					X	X	X	X	X	X	43GPZ-19-05	N1	6.00	16.00	1	
6	43GPZ-19-06-FAL23	WG	11-9-23	1211	MS					X	X	X	X	X	X	43GPZ-19-06	N1	10.00	20.00	1	
7	AAFES-2-FAL23-SRI	WG	11-10-23	0940	AF	X		X			X	X	X	X	X	AAFES-2	N1	16.20	33.30	1	
8	AAFES-5-FAL23	WG	11-9-23	1450	AF	X	X			X	X	X	X	X	X	AAFES-5	N1	15.22	30.50	1	
9	AAFES-6R-FAL23	WG	11-10-23	1225	AF	X	X			X	X	X	X	X	X	AAFES-6R	N1	15.00	26.97	1	
10	AAFES-7-FAL23-SRI	WG	11-10-23	1025	MS				X		X	X	X	X	X	AAFES-7	N1	4.50	14.50	1	
11	AOC43G-DUP02-FAL23	WG	11-10-23	0940	AF	X		X			X	X	X			AAFES-2	FD1	16.20	33.30	1	
12	AOC43G-DUP03-FAL23	WG						X			X	X	X			XGM-97-12X	FD1	24.00	34.00	1	
13	XGM-20-01A-FAL23	WG	11-10-23	1133	MS					X	X	X	X	X	X	XGM-20-01A	N1	10.50	20.50	1	
14	XGM-20-02A-FAL23	WG	11-10-23	0928	FM					X	X	X	X	X	X	XGM-20-02A	N1	13.00	23.00	1	
15	XGM-20-03A-FAL23	WG	11-9-23	1405	FM					X	X	X	X	X	X	XGM-20-03A	N1	20.00			
16	XGM-23-01-FAL23	WG	11-10-23	1225	FM	X	X			X	X	X	X	X	X	XGM-23-01	N1	23.00			
17	XGM-23-02-FAL23	WG	11-10-23	1200	DC	X	X			X	X	X	X	X	X	XGM-23-02	N1	0.00			
18	XGM-23-03-FAL23	WG	11-9-23	1345	DC	X	X			X	X	X	X	X	X	XGM-23-03	N1	0.00			
19	XGM-93-02X-FAL23-SRI	WG				X		X			X	X	X	X	X	XGM-93-02X	N1	28.00			
20	XGM-94-04X-FAL23-SRI	WG	11-9-23	1100	DC	X		X			X	X	X			XGM-94-04X	MS1	18.20			
21	XGM-94-04X-FAL23-SRI	WG	11-9-23	1100	DC	X		X			X	X	X	X	X	XGM-94-04X	N1	18.20	30.50	1	

680-242928 Chain of Custody

Relinquished by: (Signature) Bruce Clay
Date 11-10-23
Time 1400
Received by: (Signature)

Received by Laboratory: (Signature) TA
Date 11-14-23
Time 1045

1.0/1.9 5.4/5.7 2.4/2.7 3.0/3.5 0.8/1.1

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # 43G-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

						Analytical Test Method	MADEPEP (A)	MADEPVP (A)	SW6010C - Al	SW6010C - Al Fe	SW6010C (L)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9056A - SO4	SW9060A - TOC						
	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023						2	4	9	9	9	9	9	9	5	10						
	Sample ID	Matrix	Date	Time	Samp Init.												Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
22	XGM-94-04X-FAL23-SRI	WG	11-9-23	1100	DL		X		X			X	X	X			XGM-94-04X	SD1	18.20	30.50	1	
23	XGM-94-06X-FAL23	WG	11-9-23	1235	FM						X	X	X	X	X	X	XGM-94-06X	N1	17.00	27.00	1	
24	XGM-94-07X-FAL23	WG	11-10-23	0945	DL		X	X			X	X	X	X	X	X	XGM-94-07X	N1	17.00	29.60	1	
25	XGM-94-08X-FAL23	WG	11-9-23	1005	FM		X	X			X	X	X	X	X	X	XGM-94-08X	N1	23.50	36.10	1	
26	XGM-94-10X-FAL23	WG	11-10-23	1050	FM						X	X	X	X	X	X	XGM-94-10X	N1	21.50	33.80	1	
27	XGM-97-12X-FAL23-SRI	WG					X		X			X	X	X	X	X	XGM-97-12X	N1	24.00	34.00	1	
28																						
29																						
30																						
31																						
32																						
33																						
34																						
35																						
36																						
37																						

Turnaround Time: Standard

Relinquished by: (Signature) Dana Clapp
Date 11-10-23
Time 1400
Received by: (Signature)

Received by Laboratory: (Signature) DL TM
Date 11-14-23
Time 1005

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242928-2

Login Number: 242928
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 12/29/2023 4:56:10 PM

JOB DESCRIPTION

Fort Devens, Long Term Monitoring

JOB NUMBER

680-242934-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

Generated
12/29/2023 4:56:10 PM

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Qualifiers

Metals

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242934-1	XGM-93-02X-FAL23	Water	11/13/23 12:00	11/14/23 10:05
680-242934-2	XGM-97-12X-FAL23	Water	11/13/23 09:50	11/14/23 10:05

Job Narrative
680-242934-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/14/2023 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.1°C

Subcontract Work
Method MAVPH: This method was subcontracted to Katahdin Analytical Services. The subcontract laboratory certification is different from that of the facility issuing the final report. The subcontract report is appended in its entirety.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Client Sample ID: XGM-93-02X-FAL23

Date Collected: 11/13/23 12:00
Date Received: 11/14/23 10:05

Lab Sample ID: 680-242934-1

Matrix: Water

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	7100		100	50	20	ug/L		11/16/23 13:25	1
Manganese	940		10	5.0	1.3	ug/L		11/16/23 13:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	140		5.5	5.0	2.2	mg/L		11/21/23 12:55	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Client Sample ID: XGM-97-12X-FAL23

Date Collected: 11/13/23 09:50
Date Received: 11/14/23 10:05

Lab Sample ID: 680-242934-2

Matrix: Water

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	37000		100	50	20	ug/L		11/16/23 13:28	1
Manganese	2000		10	5.0	1.3	ug/L		11/16/23 13:28	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	170		5.5	5.0	2.2	mg/L		11/21/23 12:46	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-808513/1-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808513

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/16/23 12:46	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/16/23 12:46	1

Lab Sample ID: LCS 680-808513/2-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808513

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	4740		ug/L		95	87 - 115
Manganese	400	387		ug/L		97	90 - 114

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-809458/4
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	5.0	U	5.5	5.0	2.2	mg/L		11/21/23 12:00	1

Lab Sample ID: LCS 680-809458/6
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	250	240		mg/L		96	90 - 112

Lab Sample ID: LCSD 680-809458/19
Matrix: Water
Analysis Batch: 809458

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Alkalinity as CaCO3 to pH 4.5	250	244		mg/L		98	90 - 112	2	30

QC Association Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242934-2
Project/Site: Fort Devens, Long Term Monitoring

Metals

Prep Batch: 808513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242934-1	XGM-93-02X-FAL23	Total Recoverable	Water	3005A	
680-242934-2	XGM-97-12X-FAL23	Total Recoverable	Water	3005A	
MB 680-808513/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808513/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 808771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242934-1	XGM-93-02X-FAL23	Total Recoverable	Water	6010C	808513
680-242934-2	XGM-97-12X-FAL23	Total Recoverable	Water	6010C	808513
MB 680-808513/1-A	Method Blank	Total Recoverable	Water	6010C	808513
LCS 680-808513/2-A	Lab Control Sample	Total Recoverable	Water	6010C	808513

General Chemistry

Analysis Batch: 809458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242934-1	XGM-93-02X-FAL23	Total/NA	Water	2320B-2011	
680-242934-2	XGM-97-12X-FAL23	Total/NA	Water	2320B-2011	
MB 680-809458/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-809458/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-809458/19	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Client Sample ID: XGM-93-02X-FAL23

Lab Sample ID: 680-242934-1

Date Collected: 11/13/23 12:00

Matrix: Water

Date Received: 11/14/23 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	808513	11/16/23 06:21	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808771	11/16/23 13:25	BJB	EET SAV
	Instrument ID: ICPH									
Total/NA	Analysis	2320B-2011		1			809458	11/21/23 12:55	AS	EET SAV
	Instrument ID: MANTECH 2									

Client Sample ID: XGM-97-12X-FAL23

Lab Sample ID: 680-242934-2

Date Collected: 11/13/23 09:50

Matrix: Water

Date Received: 11/14/23 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	808513	11/16/23 06:21	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808771	11/16/23 13:28	BJB	EET SAV
	Instrument ID: ICPH									
Total/NA	Analysis	2320B-2011		1			809458	11/21/23 12:46	AS	EET SAV
	Instrument ID: MANTECH 2									

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242934-2
Project/Site: Fort Devens, Long Term Monitoring

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242934-2

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.	Project #:
Project Location: Fort Devens	RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SQ6351-1 and -2

Matrices: X Groundwater/Surface Water Soil/Sediment Drinking Water Air Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A	7470/7471 Hg CAM III B	MassDEP VPH CAM IV A **X**	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	X Yes No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	X Yes No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes No Yes No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes No[1]

***Data User Note**: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	X Yes No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes No[1]

[1]*All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Q.A. Officer

Printed Name: Jennifer Prescott

Date: 12/18/2023

TEST AMERICA SAVANNAH

FORT DEVENS - LTM

SQ6351

Jennifer Prescott
207-874-2400

KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074

SAMPLE DATA PACKAGE

NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
FORT DEVENS - LTM
SQ6351

Sample Receipt

The following samples were received on November 16, 2023 and were logged in under Katahdin Analytical Services work order number SQ6351 for a hardcopy due date of December 07, 2023.

KATAHDIN	TEST AMERICA SAVANNAH
Sample No.	Sample Identification
SQ6351-1	XGM-93-02X-FAL23-SRI
SQ6351-2	XGM-97-12X-FAL23-SRI

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be "^" flagged and the following language will be included in the case narrative for all DoD compliant work: "^" Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Heather Manz**. This narrative is an integral part of the Report of Analysis.

Organics Analysis

The samples of Work Order SQ6351 were analyzed in accordance with Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MADEP, May 2004, Revision 1.1. and/or for the specific methods listed below or on the Report of Analysis.

MA VPH Analysis

Samples SQ6351-1, 2, and 2DL were manually integrated for the surrogate 2,5-dibromotoluene on the PID and FID, the target analytes methyl tert-butyl ether, benzene, toluene, naphthalene, and/or the C9-C10 aromatic and C9-C12 aliphatic ranges. The specific reason for the manual integration is indicated on the raw data by the manual integration codes (M1-M11). These codes are further explained in the attachment following this narrative.

The independent check standard (file 2QI10012), associated with the initial calibration analyzed on the GC02 instrument on 9/8/23 had a high concentration for the target analyte naphthalene on the PID, which exceeded the laboratory acceptance limit of ±20% of the expected value from the ICAL.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

12/18/2023

Jennifer Prescott
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

Katahdin Analytical Services, LLC — Sample Receipt Condition Report

Client: Eurofins Savannah		KAS PM: HHM		Sampled By: Client	
Project:		KIMS Entry By: JCB		Delivered By: FedEx	
KAS Work Order#: SQ6349, 6350, 6351 (JCB 11/16)		KIMS Review By: HHM		Received By: EP	
		Labeled By: EP			
SDG #:	Cooler: 1 of 1		Date/Time Rec.:	11-16-23 0945	

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	✓				
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	✓				Temp (°C): 1.4° — Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	✓				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles:					
Aqueous: No bubble larger than a pea?	✓				
Soil/Sediment:					
Received in airtight container?				✓	
Received in methanol?				✓	
Methanol covering soil?				✓	
D.I. Water - Received within 48 hour HT?				✓	
7. Trip Blank present in cooler?				✓	
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved?					
Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2				✓	
Sulfide - >9				✓	
Cyanide – pH >12				✓	
11. Bottleware Prepped on:					

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

QA-048 – Revision 8 – 09/11/2020

SQ 6351

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756344.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242934-1
Address: 600 Technology Way,	Due Date Requested: 11/28/2023			
City: Scarborough	TAT Requested (days):			
State, Zip: ME, 04074				
Phone:	PO #:			
Email:	WO #:			
Project Name: Fort Devens, Long Term Monitoring	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (MAVPH)/ MAVPH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
XGM-93-02X-FAL23 (680-242934-1)	11/13/23	12:00 Eastern		Water			X	3	
XGM-97-12X-FAL23 (680-242934-2)	11/13/23	09:50 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11/15-23 1609			11-16-23 0915	Katahdin
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Katahdin
ANALYTICAL SERVICES

Katahdin Analytical Services

Login Chain of Custody (ln01)

Nov. 16, 2023
03:48 PM

Login Number: SQ6351

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Primary Report Address:

Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:

Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah,GA 31404

email project manager and
beth.daughtry@et.eurofinsus.com

Report CC Addresses:
Invoice CC Addresses:

Quote/Incoming: TASAV-DEVENS

Login Information

ANALYSIS INSTRUCTIONS	:	FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.
CHECK NO.	:	
CLIENT PO#	:	US1672979726
CLIENT PROJECT MANAGE	:	Jerry Lanier
CONTRACT	:	68023801, 680-242934
COOLER TEMPERATURE	:	1.4
DELIVERY SERVICES	:	FedEx
EDD FORMAT	:	ECC-091317-TXT
ISM INSTRUCTIONS	:	
LOGIN INITIALS	:	JCB
PM	:	HHM
PROJECT NAME	:	Fort Devens - LTM
QC LEVEL	:	IV
REPORT INSTRUCTIONS	:	SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinsus.com. No HC.
SDG ID	:	
SDG STATUS	:	
TEMPLATE	:	
VERBAL TAT	:	

Run Reports: Logindetail

Login Number: SQ6351

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SQ6351-1	XGM-93-02X-FAL23-SRI	13-NOV-23 12:00	16-NOV-23		07-DEC-23		

Sample Comments:

Matrix		*Product*	*Hold Date (shortest)*	*Notes*	*Bottle Type*
Aqueous	S	MA-VPH-LOD	27-NOV-23		40mL Vial+HCl
Service	S	REPORTING			

SQ6351-2	XGM-97-12X-FAL23-SRI	13-NOV-23 09:50	16-NOV-23		07-DEC-23		

Sample Comments:

Matrix		*Product*	*Hold Date (shortest)*	*Notes*	*Bottle Type*
Aqueous	S	MA-VPH-LOD	27-NOV-23		40mL Vial+HCl

Total Samples: 2 ***Total Analyses: 3***

Run Reports: Logindetail

SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL, "U" LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), but above the Method Detection Limit (MDL).

And/or

J Used for Dual Column analytes when there is a greater than 40% difference for detected concentrations between the two GC/HPLC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

I Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration (ICAL).

D Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration Verification (ICV).

C Indicates that the flagged compound did not meet DoD criteria in the corresponding opening Calibration Verification (CV).

V Indicates that the flagged compound did not meet DoD criteria in the corresponding closing Calibration Verification (CV).

L/LL Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M/MM Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike (MS) and/or Matrix Spike Duplicate MSD) prepared and/or analyzed concurrently with the native sample.

H Indicates the flagged compound was detected on the primary column but was not detected on the confirmation column therefore the compound is not reported as a positive detection. (SW846 8330A/B only)

Katahdin
ANALYTICAL SERVICES

Report of Analytical Results

SDG: SQ6351
Lab ID: SQ6351-1
Client ID: XGM-93-02X-FAL23-SRI
Matrix: AQ
Lab File ID: 2QK10065.D

Sample Date: 13-NOV-23
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 04-DEC-23
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	J	2.4	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		111.	%					
2,5-Dibromotoluene (PID)		105.	%					

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SDG: SQ6351
Lab ID: SQ6351-2
Client ID: XGM-97-12X-FAL23-SRI
Matrix: AQ
Lab File ID: 2QK10066.D

Sample Date: 13-NOV-23
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 11-DEC-23
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics		470	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	E	900	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	E	1200	ug/L	1	100	100	50.	75.
Benzene		6.3	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	E	330	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene		95	ug/L	1	5	5.0	1.6	3.8
Toluene	J	1.9	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes		62	ug/L	1	10	10.	0.92	7.5
o-Xylene		29	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		99.8	%					
2,5-Dibromotoluene (PID)		97.2	%					

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Report of Analytical Results

SDG: SQ6351
Lab ID: SQ6351-2DL
Client ID: XGM-97-12X-FAL23-SRI
Matrix: AQ
Lab File ID: 2QK10075.D

Sample Date: 13-NOV-23
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631

Report Date: 04-DEC-23
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	380	ug/L	5	100	500	250	380
C9-C12 Aliphatics	J	360	ug/L	5	100	500	250	380
C9-C10 Aromatics		520	ug/L	5	100	500	250	380
Benzene	U	10	ug/L	5	3	15.	1.6	10.
Ethylbenzene		120	ug/L	5	5	25.	2.1	19.
Methyl tert-butylether	U	19	ug/L	5	5	25.	1.6	19.
Naphthalene		36	ug/L	5	5	25.	8.0	19.
Toluene	U	19	ug/L	5	5	25.	1.7	19.
m+p-Xylenes	J	26	ug/L	5	10	50.	4.6	38.
o-Xylene	J	11	ug/L	5	5	25.	2.4	19.
2,5-Dibromotoluene (FID)		88.1	%					
2,5-Dibromotoluene (PID)		81.2	%					

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Report of Analytical Results

SDG: SQ6351
Lab ID: WG345564-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QK10051.D

Sample Date: N/A
Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564

Report Date: 04-DEC-23
Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		89.9	%					
2,5-Dibromotoluene (PID)		92.5	%					

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Report of Analytical Results

SDG: SQ6351
Lab ID: WG345631-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QK10070.D

Sample Date: N/A
Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631

Report Date: 04-DEC-23
Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		83.8	%					
2,5-Dibromotoluene (PID)		89.2	%					

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Form 2
System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SQ6351 **Matrix:** AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
XGM-93-02X-FAL23-SRI	SQ6351-1	B	111.	105.
XGM-97-12X-FAL23-SRI	SQ6351-2	B	99.8	97.2
XGM-97-12X-FAL23-SRI	SQ6351-2DL	B	88.1	81.2
Method Blank	WG345564-1	B	89.9	92.5
Laboratory Control S	WG345564-2	B	110.	115.
Laboratory Control S	WG345564-3	B	110.	112.
Method Blank	WG345631-1	B	83.8	89.2
Laboratory Control S	WG345631-2	B	112.	111.
Laboratory Control S	WG345631-3	B	115.	107.

Abbr.	Surrogate Compound	QC Limits
DBT-FID	2,5-Dibromotoluene (FID)	70-130
DBT-PID	2,5-Dibromotoluene (PID)	70-130

= Column to be used to flag recovery limits.
* = Values outside of contract required QC limits.
D= System Monitoring Compound diluted out.

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LCS/LCSD Recovery Report

LCS ID: WG345564-2
LCSD ID: WG345564-3
SDG: SQ6351
LCS File ID: 2QK10052.D

Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345564
LCSD File ID: 2QK10053.D

Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 04-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	289.	96.3	289.	96.3	ug/L	0	25	70-130
Unadjusted C9-C12 Aliphatics	200.	232.	116.	232.	116.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	112.	112.	113.	113.	ug/L	1	25	70-130
Benzene	100.	98.7	98.7	100.	100.	ug/L	1	25	70-130
Ethylbenzene	100.	103.	103.	104.	104.	ug/L	1	25	70-130
Methyl tert-butylether	100.	96.4	96.4	96.3	96.3	ug/L	0	25	70-130
Naphthalene	100.	109.	109.	109.	109.	ug/L	0	25	70-130
Toluene	100.	101.	101.	103.	103.	ug/L	2	25	70-130
m+p-Xylenes	200.	202.	101.	205.	102.	ug/L	1	25	70-130
o-Xylene	100.	105.	105.	106.	106.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			110.		110.				70-130
2,5-Dibromotoluene (PID)			115.		112.				70-130

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LCS/LCSD Recovery Report

LCS ID: WG345631-2
LCSD ID: WG345631-3
SDG: SQ6351
LCS File ID: 2QK10071.D

Extract Date: 17-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345631
LCSD File ID: 2QK10072.D

Analysis Date: 17-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 04-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	279.	93.0	270.	90.0	ug/L	3	25	70-130
Unadjusted C9-C12 Aliphatics	200.	228.	114.	227.	114.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	110.	110.	110.	110.	ug/L	0	25	70-130
Benzene	100.	98.3	98.3	97.2	97.2	ug/L	1	25	70-130
Ethylbenzene	100.	102.	102.	102.	102.	ug/L	0	25	70-130
Methyl tert-butylether	100.	95.2	95.2	95.7	95.7	ug/L	0	25	70-130
Naphthalene	100.	107.	107.	105.	105.	ug/L	2	25	70-130
Toluene	100.	100.	100.	100.	100.	ug/L	0	25	70-130
m+p-Xylenes	200.	200.	100.	197.	98.5	ug/L	2	25	70-130
o-Xylene	100.	104.	104.	103.	103.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			112.		115.				70-130
2,5-Dibromotoluene (PID)			111.		107.				70-130

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Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG345564-1
Lab File ID : 2QK10051.D
Instrument ID : GC02

SDG : SQ6351
Date Analyzed : 16-NOV-23
Time Analyzed : 17:01
Date Extracted : 16-NOV-23

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG345564-2	2QK10052.D	11/16/23	17:43
Laboratory Control S	WG345564-3	2QK10053.D	11/16/23	18:24
XGM-93-02X-FAL23-SRI	SQ6351-1	2QK10065.D	11/17/23	04:56
XGM-97-12X-FAL23-SRI	SQ6351-2	2QK10066.D	11/17/23	05:38

Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG345631-1
Lab File ID : 2QK10070.D
Instrument ID : GC02

SDG : SQ6351
Date Analyzed : 17-NOV-23
Time Analyzed : 14:18
Date Extracted : 17-NOV-23

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG345631-2	2QK10071.D	11/17/23	14:59
Laboratory Control S	WG345631-3	2QK10072.D	11/17/23	15:40
XGM-97-12X-FAL23-SRI	SQ6351-2DL	2QK10075.D	11/17/23	19:11

Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6351

Instrument ID: GC02 **Column ID:** A

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C9-C10 Aromatic	967	830	925	1037	1086	770	AVG		936		12.87041	25	O
Methyl tert-butylether	643	650	664	672	675	484	AVG		631		11.59012	25	O
Benzene	1284	1153	1230	1239	1246	873	AVG		1171		12.99251	25	O
Toluene	1077	998	1087	1130	1135	790	AVG		1036		12.58364	25	O
Ethylbenzene	1031	825	912	984	1004	700	AVG		909		13.93204	25	O
m+p-Xylene	1280	1073	1172	1224	1227	847	AVG		1137		13.93579	25	O
o-Xylene	980	914	1008	1056	1063	743	AVG		961		12.47813	25	O
1,2,4-trimethylbenzene	967	830	925	1037	1086	770	AVG		936		12.87041	25	O
Naphthalene	1131	931	965	1148	1264	1053	AVG		1082		11.47660	25	O
2,5-Dibromotoluene (PID)	868	610	669	803	920	714	AVG		764		15.69288	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

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Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6351

Instrument ID: GC02 **Column ID:** B

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C5-C8 Aliphatic	1368	1462	1510	1515	1550	1110	AVG		1419		11.55808	25	O
C9-C12 Aliphatic	1382	987	1139	1412	1613	1351	AVG		1314		16.76788	25	O
n-Pentane	1678	1360	1331	1423	1436	1022	AVG		1375		15.42459	25	O
2-Methylpentane	1325	1489	1568	1504	1565	1104	AVG		1426		12.68114	25	O
Methyl tert-butylether	1263	1466	1350	1342	1364	980	AVG		1294		12.92115	25	O
2,2,4-Trimethylpentane	1102	1535	1630	1619	1650	1205	AVG		1457		16.50443	25	O
Benzene	2236	1912	2014	2062	2078	1440	AVG		1957		14.02254	25	O
Toluene	2246	1805	1973	2008	2022	1402	AVG		1909		14.97234	25	O
n-Nonane	1233	1074	1149	1315	1445	1251	AVG		1244		10.38257	25	O
n-Decane	1302	833	875	1165	1553	1352	AVG		1180		23.90207	25	O
Ethylbenzene	1982	1598	1747	1898	1949	1366	AVG		1757		13.60981	25	O
m+p-Xylene	2144	1814	1973	2094	2091	1446	AVG		1927		13.69605	25	O
o-Xylene	2030	1823	2010	2129	2137	1484	AVG		1935		12.83633	25	O
1,2,4-trimethylbenzene	1886	1537	1710	1887	1985	1413	AVG		1736		12.94449	25	O
n-Butylcyclohexane	1461	1141	1402	1660	1673	1350	AVG		1448		13.85802	25	O
Naphthalene	1511	1246	1284	1588	1686	1382	AVG		1450		12.03582	25	O
2,5-Dibromotoluene (FID)	653	397	443	529	572	438	AVG		505		19.17753	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345564-4
Analytical Date: 11/16/23 14:28
Lab File ID: 2QK10050.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	998	998	0.100	6.60402	25.000	Averaged	
Methyl tert-butylether	631	634	634	0.100	0.47833	25.000	Averaged	
Benzene	1171	1167	1167	0.100	-0.35408	25.000	Averaged	
Toluene	1036	1066	1066	0.100	2.83514	25.000	Averaged	
Ethylbenzene	909	930	930	0.100	2.31487	25.000	Averaged	
m+p-Xylene	1137	1158	1158	0.100	1.86422	25.000	Averaged	
o-Xylene	961	1009	1009	0.100	5.04246	25.000	Averaged	
1,2,4-trimethylbenzene	936	998	998	0.100	6.60272	25.000	Averaged	
Naphthalene	1082	1075	1075	0.100	-0.60736	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	738	738	0.100	-3.38657	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345564-4
Analytical Date: 11/16/23 14:28
Lab File ID: 2QK10050.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1465	1465	0.100	3.21119	25.000	Averaged	
C9-C12 Aliphatic	1314	1310	1310	0.100	-0.26845	25.000	Averaged	
n-Pentane	1375	1337	1337	0.100	-2.72731	25.000	Averaged	
2-Methylpentane	1426	1466	1466	0.100	2.82124	25.000	Averaged	
Methyl tert-butylether	1294	1382	1382	0.100	6.79350	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1591	1591	0.100	9.19703	25.000	Averaged	
Benzene	1957	2098	2098	0.100	7.19890	25.000	Averaged	
Toluene	1909	2049	2049	0.100	7.30622	25.000	Averaged	
n-Nonane	1244	1286	1286	0.100	3.35508	30.000	Averaged	
n-Decane	1180	1039	1039	0.100	-11.99269	25.000	Averaged	
Ethylbenzene	1757	1940	1940	0.100	10.43258	25.000	Averaged	
m+p-Xylene	1927	2106	2106	0.100	9.28072	25.000	Averaged	
o-Xylene	1935	2162	2162	0.100	11.72170	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1962	1962	0.100	12.98448	25.000	Averaged	
n-Butylcyclohexane	1448	1582	1582	0.100	9.28741	25.000	Averaged	
Naphthalene	1450	1551	1551	0.100	6.97204	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	499	499	0.100	-1.34508	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345564-5
Analytical Date: 11/17/23 06:20
Lab File ID: 2QK10067.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1007	1007	0.100	7.62309	25.000	Averaged	
Methyl tert-butylether	631	656	656	0.100	3.89383	25.000	Averaged	
Benzene	1171	1200	1200	0.100	2.51745	25.000	Averaged	
Toluene	1036	1097	1097	0.100	5.90807	25.000	Averaged	
Ethylbenzene	909	949	949	0.100	4.40221	25.000	Averaged	
m+p-Xylene	1137	1180	1180	0.100	3.74619	25.000	Averaged	
o-Xylene	961	1030	1030	0.100	7.17216	25.000	Averaged	
1,2,4-trimethylbenzene	936	1007	1007	0.100	7.62218	25.000	Averaged	
Naphthalene	1082	1127	1127	0.100	4.21040	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	786	786	0.100	2.83321	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345564-5
Analytical Date: 11/17/23 06:20
Lab File ID: 2QK10067.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1431	1431	0.100	0.84261	25.000	Averaged	
C9-C12 Aliphatic	1314	1162	1162	0.100	-11.56995	25.000	Averaged	
n-Pentane	1375	1316	1316	0.100	-4.30261	25.000	Averaged	
2-Methylpentane	1426	1451	1451	0.100	1.76376	25.000	Averaged	
Methyl tert-butylether	1294	1476	1476	0.100	14.05257	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1527	1527	0.100	4.79708	25.000	Averaged	
Benzene	1957	2156	2156	0.100	10.16816	25.000	Averaged	
Toluene	1909	2104	2104	0.100	10.19962	25.000	Averaged	
n-Nonane	1244	1128	1128	0.100	-9.31881	30.000	Averaged	
n-Decane	1180	909	909	0.100	-22.98068	25.000	Averaged	
Ethylbenzene	1757	1978	1978	0.100	12.61623	25.000	Averaged	
m+p-Xylene	1927	2158	2158	0.100	11.98575	25.000	Averaged	
o-Xylene	1935	2208	2208	0.100	14.10882	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1977	1977	0.100	13.88641	25.000	Averaged	
n-Butylcyclohexane	1448	1415	1415	0.100	-2.26961	25.000	Averaged	
Naphthalene	1450	1682	1682	0.100	16.03228	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	545	545	0.100	7.80993	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345631-4
Analytical Date: 11/17/23 12:53
Lab File ID: 2QK10069.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	998	998	0.100	6.66963	25.000	Averaged	
Methyl tert-butylether	631	639	639	0.100	1.23241	25.000	Averaged	
Benzene	1171	1161	1161	0.100	-0.80505	25.000	Averaged	
Toluene	1036	1046	1046	0.100	0.90490	25.000	Averaged	
Ethylbenzene	909	916	916	0.100	0.74221	25.000	Averaged	
m+p-Xylene	1137	1142	1142	0.100	0.38854	25.000	Averaged	
o-Xylene	961	998	998	0.100	3.91828	25.000	Averaged	
1,2,4-trimethylbenzene	936	998	998	0.100	6.66898	25.000	Averaged	
Naphthalene	1082	1088	1088	0.100	0.60171	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	761	761	0.100	-0.33165	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345631-4
Analytical Date: 11/17/23 12:53
Lab File ID: 2QK10069.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1546	1546	0.100	8.92253	25.000	Averaged	
C9-C12 Aliphatic	1314	1377	1377	0.100	4.79435	25.000	Averaged	
n-Pentane	1375	1422	1422	0.100	3.40514	25.000	Averaged	
2-Methylpentane	1426	1546	1546	0.100	8.40177	25.000	Averaged	
Methyl tert-butylether	1294	1411	1411	0.100	9.01279	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1670	1670	0.100	14.63897	25.000	Averaged	
Benzene	1957	2104	2104	0.100	7.55051	25.000	Averaged	
Toluene	1909	2023	2023	0.100	5.96218	25.000	Averaged	
n-Nonane	1244	1303	1303	0.100	4.70508	30.000	Averaged	
n-Decane	1180	1092	1092	0.100	-7.41817	25.000	Averaged	
Ethylbenzene	1757	1926	1926	0.100	9.63222	25.000	Averaged	
m+p-Xylene	1927	2096	2096	0.100	8.77003	25.000	Averaged	
o-Xylene	1935	2156	2156	0.100	11.40445	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1983	1983	0.100	14.20433	25.000	Averaged	
n-Butylcyclohexane	1448	1661	1661	0.100	14.74819	25.000	Averaged	
Naphthalene	1450	1617	1617	0.100	11.57873	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	513	513	0.100	1.53243	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345631-5
Analytical Date: 11/18/23 00:09
Lab File ID: 2QK10082.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	978	978	0.100	4.51053	25.000	Averaged	
Methyl tert-butylether	631	642	642	0.100	1.66647	25.000	Averaged	
Benzene	1171	1166	1166	0.100	-0.44290	25.000	Averaged	
Toluene	1036	1062	1062	0.100	2.47804	25.000	Averaged	
Ethylbenzene	909	917	917	0.100	0.86319	25.000	Averaged	
m+p-Xylene	1137	1140	1140	0.100	0.27773	25.000	Averaged	
o-Xylene	961	999	999	0.100	3.99114	25.000	Averaged	
1,2,4-trimethylbenzene	936	978	978	0.100	4.51038	25.000	Averaged	
Naphthalene	1082	1108	1108	0.100	2.45227	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	774	774	0.100	1.36203	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6351
Lab ID: WG345631-5
Analytical Date: 11/18/23 00:09
Lab File ID: 2QK10082.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1485	1485	0.100	4.63327	25.000	Averaged	
C9-C12 Aliphatic	1314	1249	1249	0.100	-4.95680	25.000	Averaged	
n-Pentane	1375	1368	1368	0.100	-0.52801	25.000	Averaged	
2-Methylpentane	1426	1498	1498	0.100	5.06523	25.000	Averaged	
Methyl tert-butylether	1294	1436	1436	0.100	10.96163	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1589	1589	0.100	9.08172	25.000	Averaged	
Benzene	1957	2146	2146	0.100	9.68674	25.000	Averaged	
Toluene	1909	2086	2086	0.100	9.27776	25.000	Averaged	
n-Nonane	1244	1214	1214	0.100	-2.42901	30.000	Averaged	
n-Decane	1180	997	997	0.100	-15.47739	25.000	Averaged	
Ethylbenzene	1757	1966	1966	0.100	11.89215	25.000	Averaged	
m+p-Xylene	1927	2158	2158	0.100	12.00547	25.000	Averaged	
o-Xylene	1935	2223	2223	0.100	14.85803	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1957	1957	0.100	12.71609	25.000	Averaged	
n-Butylcyclohexane	1448	1500	1500	0.100	3.61803	25.000	Averaged	
Naphthalene	1450	1677	1677	0.100	15.68874	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	565	565	0.100	11.74030	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 8
GC Analytical Sequence

Lab Name : Katahdin Analytical Services **SDG :** SQ6351
Instrument ID : GC02

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG342400-4	09/08/23	11:40		31.608
Initial Calibration	WG342400-4	09/08/23	11:40	31.597	
Initial Calibration	WG342400-1	09/08/23	12:21		31.591
Initial Calibration	WG342400-1	09/08/23	12:21	31.577	
Initial Calibration	WG342400-2	09/08/23	13:02		31.599
Initial Calibration	WG342400-2	09/08/23	13:02	31.589	
Initial Calibration	WG342400-3	09/08/23	13:43		31.593
Initial Calibration	WG342400-3	09/08/23	13:43	31.583	
Initial Calibration	WG342400-5	09/08/23	14:25		31.599
Initial Calibration	WG342400-5	09/08/23	14:25	31.588	
Initial Calibration	WG342400-6	09/08/23	15:06		31.597
Initial Calibration	WG342400-6	09/08/23	15:06	31.587	
Independent Source	WG342400-7	09/08/23	17:40	31.599	31.612
Continuing Calibrati	WG345564-4	11/16/23	14:28	31.497	31.507
Method Blank	WG345564-1	11/16/23	17:01	31.523	31.534
Laboratory Control S	WG345564-2	11/16/23	17:43	31.512	31.522
Laboratory Control S	WG345564-3	11/16/23	18:24	31.504	31.514
XGM-93-02X-FAL23-SRI	SQ6351-1	11/17/23	04:56	31.445	31.455
XGM-97-12X-FAL23-SRI	SQ6351-2	11/17/23	05:38	31.443	31.452
Continuing Calibrati	WG345564-5	11/17/23	06:20	31.442	31.452
Continuing Calibrati	WG345631-4	11/17/23	12:53	31.5	31.51
Method Blank	WG345631-1	11/17/23	14:18	31.517	31.528
Laboratory Control S	WG345631-2	11/17/23	14:59	31.513	31.523
Laboratory Control S	WG345631-3	11/17/23	15:40	31.51	31.52
XGM-97-12X-FAL23-SRI	SQ6351-2DL	11/17/23	19:11	31.482	31.496
Continuing Calibrati	WG345631-5	11/18/23	00:09	31.469	31.479

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CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # AOC43G_LTM_FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023
Project Number: DEVNS-LTM PO 2312 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
A2320B (A) = Alkalinity
MADEPVP (A) = VPH with targets

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
46	1x 250mL, plastic, Cool < 6degC

Analytical Test Method: A2320B (A) – 46; MADEPVP (A) – 4; SW6010C - Fe Mn – 9; SW6010C - Mn – 9

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023

	Sample ID	Matrix	Date	Time	Samp Init.	A2320B (A)	MADEPVP (A)	SW6010C - Fe Mn	SW6010C - Mn	Location ID	Sample Type	Depth (ft bgs) Top	Bottom	Cooler	Comments
1	AAFES-2-FAL23	WG				X	X	X		AAFES-2	N1	16.20	33.30	1	
2	AAFES-7-FAL23	WG							X	AAFES-7	N1	4.50	14.50	1	
3	AOC43G_DUP01-FAL23	WG				X	X	X		AAFES-2	FD1	16.20	33.30	1	
4	XGM-93-02X-FAL23	WG	11-13-23	1200	DC	X	X	X		XGM-93-02X	N1	28.00	38.00	1	
5	XGM-94-04X-FAL23	WG				X	X	X		XGM-94-04X	MS1	18.20	30.50	1	
6	XGM-94-04X-FAL23	WG				X	X	X		XGM-94-04X	N1	18.20	30.50	1	
7	XGM-94-04X-FAL23	WG				X	X	X		XGM-94-04X	SD1	18.20	30.50	1	
8	XGM-97-12X-FAL23	WG	11-13-23	0950	DC	X	X	X		XGM-97-12X	N1	24.00	34.00	1	
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															

Turnaround Time: NA

680-242934 Chain of Custody

C. Munro 11/14/23 1005
1.8/2.1

Relinquished by: (Signature) [signature] 11-13-23 1700
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature)
Date
Time

12/29/2023

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242934-2

Login Number: 242934
List Number: 1
Creator: Munro, Caroline

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 11/22/2023 8:16:03 PM

JOB DESCRIPTION

Fort Devens, Long Term Monitoring

JOB NUMBER

680-242974-3

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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11/22/2023 8:16:03 PM

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-242974-3
Project/Site: Fort Devens, Long Term Monitoring

Qualifiers

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242974-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242974-11	AOC43G-DUP01-FAL23	Water	11/13/23 09:50	11/14/23 10:05

Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242974-3

Job ID: 680-242974-3

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-242974-3

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/14/2023 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 3.0°C, 3.4°C and 3.9°C

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242974-3

Client Sample ID: AOC43G-DUP01-FAL23

Lab Sample ID: 680-242974-11

Date Collected: 11/13/23 09:50

Matrix: Water

Date Received: 11/14/23 10:05

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	36000		100	50	20	ug/L		11/16/23 15:55	1
Manganese	1900		10	5.0	1.3	ug/L		11/16/23 15:55	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	35000		100	50	20	ug/L		11/16/23 16:43	1
Manganese	1900		10	5.0	1.3	ug/L		11/16/23 16:43	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	18		5.0	3.0	0.86	ug/L		11/16/23 19:41	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	19		5.0	3.0	0.86	ug/L		11/17/23 01:54	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-808512/1-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808512

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/16/23 15:21	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/16/23 15:21	1

Lab Sample ID: LCS 680-808512/2-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808512

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	4590		ug/L		92	87 - 115
Manganese	400	376		ug/L		94	90 - 114

Lab Sample ID: MB 680-808523/1-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808523

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/16/23 16:02	1
Manganese	1.62	J	10	5.0	1.3	ug/L		11/16/23 16:02	1

Lab Sample ID: LCS 680-808523/2-A
Matrix: Water
Analysis Batch: 808771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808523

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	4610		ug/L		92	87 - 115
Manganese	400	380		ug/L		95	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-808516/1-A
Matrix: Water
Analysis Batch: 808833

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808516

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/16/23 18:52	1

Lab Sample ID: LCS 680-808516/2-A
Matrix: Water
Analysis Batch: 808833

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	111		ug/L		111	84 - 116

Lab Sample ID: MB 680-808524/1-A
Matrix: Water
Analysis Batch: 808833

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808524

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/17/23 00:45	1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-808524/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 808833
Prep Batch: 808524

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			100	105		ug/L		105	84 - 116		

Metals

Prep Batch: 808512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Total Recoverable	Water	3005A	
MB 680-808512/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808512/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 808516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Total Recoverable	Water	3005A	
MB 680-808516/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808516/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 808523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Dissolved	Water	3005A	
MB 680-808523/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808523/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 808524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Dissolved	Water	3005A	
MB 680-808524/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808524/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 808771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Dissolved	Water	6010C	808523
680-242974-11	AOC43G-DUP01-FAL23	Total Recoverable	Water	6010C	808512
MB 680-808512/1-A	Method Blank	Total Recoverable	Water	6010C	808512
MB 680-808523/1-A	Method Blank	Total Recoverable	Water	6010C	808523
LCS 680-808512/2-A	Lab Control Sample	Total Recoverable	Water	6010C	808512
LCS 680-808523/2-A	Lab Control Sample	Total Recoverable	Water	6010C	808523

Analysis Batch: 808833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242974-11	AOC43G-DUP01-FAL23	Dissolved	Water	6020A	808524
680-242974-11	AOC43G-DUP01-FAL23	Total Recoverable	Water	6020A	808516
MB 680-808516/1-A	Method Blank	Total Recoverable	Water	6020A	808516
MB 680-808524/1-A	Method Blank	Total Recoverable	Water	6020A	808524
LCS 680-808516/2-A	Lab Control Sample	Total Recoverable	Water	6020A	808516
LCS 680-808524/2-A	Lab Control Sample	Total Recoverable	Water	6020A	808524

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242974-3

Client Sample ID: AOC43G-DUP01-FAL23

Date Collected: 11/13/23 09:50
Date Received: 11/14/23 10:05

Lab Sample ID: 680-242974-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	808523	11/16/23 07:48	RR	EET SAV
Dissolved	Analysis	6010C		1			808771	11/16/23 16:43	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	25 mL	808512	11/16/23 06:17	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808771	11/16/23 15:55	BJB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	808524	11/16/23 07:48	RR	EET SAV
Dissolved	Analysis	6020A		1			808833	11/17/23 01:54	BWR	EET SAV
	Instrument ID: ICPMSC									
Total Recoverable	Prep	3005A			25 mL	125 mL	808516	11/16/23 06:17	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808833	11/16/23 19:41	BWR	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242974-3
Project/Site: Fort Devens, Long Term Monitoring

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-242974-3

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

US Army Corps of Engineers

CHAIN OF CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7 Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

Project Name: Former Fort Devens, Long Term Monitoring
Project Number: DEVNS-LTM PO 2106 - 00000001
WBS Code:

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
POC: Jerry Lanier 912-250-0281 jerry.lanier@eurofinsus.com
Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 57, Fall 2023

Comments:
[illegible] (A) = EPH with PAHs
[illegible] (A) = VPH with targets
[illegible] = Dissolved Gases
[illegible]
[illegible]
[illegible]

680-242974 Chain of Custody

Code	Matrix
WG	Ground Water
WS	Surface Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH <2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

[illegible signature] 11/14/23 1005

2.7/3.0 3.6/3.9 3.1/3.4

Analytical Test Method: MADEPEP (A) – 2; MADEPVP (A) – 4; RSK175 (A) – 8; SW6010C (L) – 9; SW6010C/FLDFLT (L) – 9; SW6020B - As – 9; SW6020B/FLDFLT (B) – 9; SW9056A - SO4, NO2, NO3 – 5; SW9060A - TOC – 10

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 57, Fall 2023

#	Sample ID	Matrix	Date	Time	Samp Init.	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9056A - SO4, NO2, NO3	SW9060A - TOC	Location ID	Sample Type	Depth Top (ft bgs)	Depth Bottom (ft bgs)	Cooler	Comments
20	57M-03-03X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-03X	SD1	2.00	12.00	1	
21	57M-03-04X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-04X	N1	2.00	12.00	1	
22	57M-03-05X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-05X	N1	2.00	12.00	1	
23	57M-03-06X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-06X	N1	2.00	12.00	1	
24	57M-95-03X-FAL23	WG	11-13-23	0935	MS	X	X	X	X	X	X	X	X	X	57M-95-03X	N1	7.00	17.00	1	
25	57M-95-06X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-95-06X	N1	11.87	21.87	1	
26	57M-96-11X-FAL23	WG	11-13-23	1540	FM	X	X	X	X	X	X	X	X	X	57M-96-11X	N1	2.00	12.00	1	
27	57M-96-12X-FAL23	WG	11-13-23	1300	AF	X	X	X	X	X	X	X	X	X	57M-96-12X	N1	2.00	12.00	1	
28	57P-98-03X-FAL23	WG	11-13-23	1455	AF	X	X	X	X	X	X	X	X	X	57P-98-03X	N1	2.50	5.50	1	
29	57P-98-04X-FAL23	WG				X	X	X	X	X	X	X	X	X	57P-98-04X	N1	2.00	5.00	1	
30	57WP-06-03-FAL23	WG				X	X	X	X	X	X	X	X	X	57WP-06-03	N1	13.85	18.85	1	
31	AOC57-DUP01-FAL23	WG				X	X	X	X	X	X	X	X	X	5703MW-20-01B	FD1	50.00	60.00	1	
32	AOC57-DUP02-FAL23	WG	11-13-23	0935	MS	X	X	X	X	X	X	X	X	X	57M-95-03X	FD1	7.00	17.00	1	
33	AOC57-DUP03-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-96-11X	FD1	2.00	12.00	1	
34																				
35																				
36																				
37																				

Turnaround Time: Standard

Relinquished by: (Signature) [illegible signature]
Date 11-13-23
Time 1900

COC # AOC57_SRI_FAL23

CHAIN-OF-CUSTODY RECORD

US Army Corps of Engineers

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

Project Name: Former Fort Devens, Long Term Monitoring
Project Number: DEVNS-LTM PO 2106 - 00000001
COC Code:

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com
Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 57, Fall 2023

Comments:
Equipment:

Code	Matrix
WG	Ground Water
WS	Surface Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

11/14/23
1005

2.7/3.0 3.6/3.9 3.1/3.4

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 57, Fall

	Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method: MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9056A - SO4, NO2, NO3	SW9060A - TOC	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
						2	4	8	9	9	9	9	5	10						
1	57-SW1-FAL23	WS				X	X	X	X	X	X	X	X	X	57-SW1	N1	0.00	0.00	1	
2	57-SW2-FAL23	WS				X	X	X	X	X	X	X	X	X	57-SW2	N1	0.00	0.00	1	
3	57-SW3-FAL23	WS				X	X	X	X	X	X	X	X	X	57-SW3	N1	0.00	0.00	1	
4	57-SW4-FAL23	WS	11-13-23	1520	MS	X	X	X	X	X	X	X	X	X	57-SW4	N1	0.00	0.00	1	
5	5702MW-20-01A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-01A	N1	30.00	40.00	1	
6	5702MW-20-01B-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-01B	N1	70.00	80.00	1	
7	5702MW-20-02A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-02A	MS1	30.00	40.00	1	
8	5702MW-20-02A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-02A	N1	30.00	40.00	1	
9	5702MW-20-02A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-02A	SD1	30.00	40.00	1	
10	5702MW-20-03A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-03A	N1	26.00	36.00	1	
11	5702MW-20-04A-FAL23	WG				X	X	X	X	X	X	X	X	X	5702MW-20-04A	N1	70.00	80.00	1	
12	5703MW-20-01A-FAL23	WG	11-13-23	1409	MS	X	X	X	X	X	X	X	X	X	5703MW-20-01A	N1	2.00	12.00	1	
13	5703MW-20-01B-FAL23	WG				X	X	X	X	X	X	X	X	X	5703MW-20-01B	N1	50.00	60.00	1	
14	5703MW-20-02A-FAL23	WG				X	X	X	X	X	X	X	X	X	5703MW-20-02A	N1	10.00	20.00	1	
15	5703MW-20-03A-FAL23	WG	11-13-23	1100	AF	X	X	X	X	X	X	X	X	X	5703MW-20-03A	N1	50.00	60.00	1	
16	5703MW-20-04A-FAL23	WG	11-13-23	1135	MS	X	X	X	X	X	X	X	X	X	5703MW-20-04A	N1	60.00	70.00	1	
17	57M-03-02X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-02X	N1	2.00	12.00	1	
18	57M-03-03X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-03X	MS1	2.00	12.00	1	
19	57M-03-03X-FAL23	WG				X	X	X	X	X	X	X	X	X	57M-03-03X	N1	2.00	12.00	1	

11/22/2023

RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7 Charleston SC 2945
(843) 619-370-0374, jennifer.singer@arcadis.com

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
POC: Jerry Lanier 912-250-0281 jerry.lanier@eurofinsus.com
Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Long T
Monitoring, AOC 50, Fall 2023

...ort Stevens, Long Term Monitoring
...VNS-LTM PO 2312 00000001

Code	Matrix
WG	Ground Water

Code	Container/Preservative
6	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
29	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
46	1x 250mL, plastic, Cool < 6degC
47	1x 500mL, amber glass, H2SO4; Cool < 6degC

Compliance

	Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	A2320B (A)	E353.2 (A)	RSK175 (A)	SW6010C/FLDFLT (B)	SW8020A/FLDFLT (B)	SW8260B - VOCs	SW9034 (A)	SW9056A - SO4	SW9060A - TOC
							46	47	8	9	9	29	7	5	10
41	MW-3-FAL23	WG								X	X	X			
42	MW-7-FAL23	WG								X	X	X			
43	XSA-12-95X-FAL23	WG	11-13-23		FM					X	X	X			
44	XSA-12-96X-FAL23	WG								X	X	X			
45	XSA-12-97X-FAL23	WG								X	X	X			
46	XSA-12-98X-FAL23	WG													
47															
48															
49															
50															
51															
52															
53															
54															
55															
56															

Location ID	Sample Type	Depth (ft bgs) Top - Bottom		Cooler
MW-3	SD1	126.00	136.00	1
MW-7	N1	6.58	135.00	1
XSA-12-95X	N1	120.00	130.00	1
XSA-12-96X	N1	120.00	130.00	1
XSA-12-97X	N1	120.00	130.00	1
XSA-12-98X	N1	60.00	70.00	1

Turnaround Time: Standard

11/14/23 1005

2.7/3.0 3.6/3.9 3.1/3.4

Relinquished by: (Signature) 11-13-23 1700
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature)

11/22/2023

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # 43G-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

						Analytical Test Method	MADEPEP (A)	MADEPVP (A)	SW6010C - Al	SW6010C - Al Fe	SW6010C (L)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9056A - SO4	SW9060A - TOC					
	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023						2	4	9	9	9	9	9	9	5	10					
	Sample ID	Matrix	Date	Time	Samp Init.												Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
22	XGM-94-04X-FAL23-SRI	WG					X		X			X	X	X			XGM-94-04X	SD1	18.20	30.50	1	
23	XGM-94-06X-FAL23	WG									X	X	X	X	X	X	XGM-94-06X	N1	17.00	27.00	1	
24	XGM-94-07X-FAL23	WG					X	X			X	X	X	X	X	X	XGM-94-07X	N1	17.00	29.60	1	
25	XGM-94-08X-FAL23	WG					X	X			X	X	X	X	X	X	XGM-94-08X	N1	23.50	36.10	1	
26	XGM-94-10X-FAL23	WG									X	X	X	X	X	X	XGM-94-10X	N1	21.50	33.80	1	
27	XGM-97-12X-FAL23-SRI	WG	11-13-23	0950	DC		X		X			X	X	X	X	X	XGM-97-12X	N1	24.00	34.00	1	
28																						
29																						
30																						
31																						
32																						
33																						
34																						
35																						
36																						
37																						

Turnaround Time: Standard

11/14/23 1005

Relinquished by: (Signature) Date Time Received by: (Signature)

11/13/23 1700

Received by Laboratory: (Signature) Date Time

2.7/3.0 3.6/3.9 3.1/3.4

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242974-3

Login Number: 242974

List Source: Eurofins Savannah

List Number: 1

Creator: Johnson, Corey M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 12/28/2023 9:27:19 AM

JOB DESCRIPTION

Fort Devens, SRI, AOC69W, Fall 2023

JOB NUMBER

680-243065-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

Generated
12/28/2023 9:27:19 AM

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Qualifiers

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-243065-2	69W-94-14-FAL23	Water	11/15/23 09:50	11/16/23 10:30
680-243065-3	ZWM-95-15X-FAL23	Water	11/15/23 11:35	11/16/23 10:30

Job ID: 680-243065-2 — Eurofins Savannah

Job Narrative
680-243065-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/16/2023 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.9°C

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Client Sample ID: 69W-94-14-FAL23
Lab Sample ID: 680-243065-2

Date Collected: 11/15/23 09:50
Matrix: Water
Date Received: 11/16/23 10:30

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/21/23 08:06	1
Iron	**43**	**J**	100	50	20	ug/L		11/21/23 08:06	1
Manganese	**120**		10	5.0	1.3	ug/L		11/21/23 08:06	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/21/23 23:49	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Client Sample ID: ZWM-95-15X-FAL23
Lab Sample ID: 680-243065-3

Date Collected: 11/15/23 11:35
Matrix: Water
Date Received: 11/16/23 10:30

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	94	J	200	150	54	ug/L		11/21/23 08:08	1
Iron	1200		100	50	20	ug/L		11/21/23 08:08	1
Manganese	380		10	5.0	1.3	ug/L		11/21/23 08:08	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	7.7		5.0	3.0	0.86	ug/L		11/21/23 23:53	1

QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Job ID: 680-243065-2

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-809153/1-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 809153

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/21/23 07:42	1
Iron	50	U	100	50	20	ug/L		11/21/23 07:42	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/21/23 07:42	1

Lab Sample ID: LCS 680-809153/2-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 809153

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	5050	5090		ug/L		101	86 - 115
Iron	4990	5000		ug/L		100	87 - 115
Manganese	400	407		ug/L		102	90 - 114

Metals

Prep Batch: 809153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243065-2	69W-94-14-FAL23	Dissolved	Water	3005A	
680-243065-3	ZWM-95-15X-FAL23	Dissolved	Water	3005A	
MB 680-809153/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-809153/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 809155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243065-2	69W-94-14-FAL23	Dissolved	Water	3005A	
680-243065-3	ZWM-95-15X-FAL23	Dissolved	Water	3005A	

Analysis Batch: 809393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243065-2	69W-94-14-FAL23	Dissolved	Water	6010C	809153
680-243065-3	ZWM-95-15X-FAL23	Dissolved	Water	6010C	809153
MB 680-809153/1-A	Method Blank	Total Recoverable	Water	6010C	809153
LCS 680-809153/2-A	Lab Control Sample	Total Recoverable	Water	6010C	809153

Analysis Batch: 809672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243065-2	69W-94-14-FAL23	Dissolved	Water	6020A	809155
680-243065-3	ZWM-95-15X-FAL23	Dissolved	Water	6020A	809155

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Job ID: 680-243065-2

Client Sample ID: 69W-94-14-FAL23

Lab Sample ID: 680-243065-2

Date Collected: 11/15/23 09:50

Matrix: Water

Date Received: 11/16/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809153	11/20/23 06:18	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/21/23 08:06	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809155	11/20/23 06:18	RR	EET SAV
Dissolved	Analysis	6020A		1			809672	11/21/23 23:49	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: ZWM-95-15X-FAL23

Lab Sample ID: 680-243065-3

Date Collected: 11/15/23 11:35

Matrix: Water

Date Received: 11/16/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809153	11/20/23 06:18	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/21/23 08:08	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809155	11/20/23 06:18	RR	EET SAV
Dissolved	Analysis	6020A		1			809672	11/21/23 23:53	BJB	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243065-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

Analytical Test Method

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023

	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC
	2	4	8	9	9	9	9	9	9	7	5	10

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	69W-23-01-FAL23	WG				69W-23-01	N1	2.00	12.00	1	
2	69W-23-02-FAL23	WG				69W-23-02	N1	4.00	14.00	1	
3	69W-23-03-FAL23	WG				69W-23-03	N1	4.00	14.00	1	
4	69W-94-12-FAL23	WG	11-15-23	1335	DC	69W-94-12	N1	3.00	13.00	1	
5	69W-94-13-FAL23-SRI	WG				69W-94-13	N1	3.00	13.00	1	
6	69W-94-14-FAL23-SRI	WG	11-15-23	950	DC	69W-94-14	N1	3.00	13.00	1	
7	69WP-08-01-FAL23-SRI	WG				69WP-08-01	N1	10.00	13.00	1	
8	69WP-13-01-FAL23-SRI	WG				69WP-13-01	N1	0.00	0.00	1	
9	AOC69W-DUP02-FAL23-SRI	WG				69W-94-13	FD1	3.00	13.00	1	
10	AOC69W-DUP03-FAL23-SRI	WG				ZWM-99-22X	FD1	4.60	14.63	1	
11	ZWM-01-25X-FAL23-SRI	WG				ZWM-01-25X	N1	4.00	16.13	1	
12	ZWM-01-26X-FAL23	WG				ZWM-01-26X	N1	4.00	16.45	1	
13	ZWM-95-15X-FAL23-SRI	WG	11-15-23	1135	DC	ZWM-95-15X	N1		15.87	1	
14	ZWM-95-16X-FAL23	WG				ZWM-95-16X	N1				
15	ZWM-95-17X-FAL23	WG				ZWM-95-17X	N1				
16	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	MS1				
17	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	N1				
18	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	SD1				
19	ZWM-99-22X-FAL23-SRI	WG				ZWM-99-22X	N1				
20	ZWM-99-23X-FAL23-SRI	WG				ZWM-99-23X	N1	3.00	14.68	1	
21	ZWM-99-24X-FAL23-SRI	WG				ZWM-99-24X	N1	2.50	15.52	1	

680-243065 Chain of Custody

Relinquished by: (Signature) Drew Clyr
Date 11/15/23
Time 1700
Received by: (Signature)

Received by Laboratory: (Signature) TA
Date 11-16-23
Time 1030
3.6/3.9

12/28/2023

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243065-2

Login Number: 243065
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 2/15/2024 10:49:43 AM Revision 1

JOB DESCRIPTION

Fort Devens, SRI, AOC69W, Fall 2023

JOB NUMBER

680-243142-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

myEOL

Job Notes

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Authorization

Beth a Daughtry

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2/15/2024 10:49:43 AM
Revision 1

Authorized for release by
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Designee for
Jerry Lanier, Project Manager I
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(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Qualifiers

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-243142-1	69W-94-13-FAL23-SRI	Water	11/14/23 12:25	11/15/23 10:07
680-243142-3	ZWM-99-24X-FAL23-SRI	Water	11/14/23 13:40	11/15/23 10:07

Job Narrative
680-243142-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Revision
Revised report - missing data for Dissolved Al for samples 1 & 3.

Receipt
The samples were received on 11/15/2023 10:07 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.7°C

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Client Sample ID: 69W-94-13-FAL23-SRI
Lab Sample ID: 680-243142-1

Date Collected: 11/14/23 12:25
Matrix: Water
Date Received: 11/15/23 10:07

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/21/23 08:20	1
Iron	**570**		100	50	20	ug/L		11/21/23 08:20	1
Manganese	**320**		10	5.0	1.3	ug/L		11/21/23 08:20	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**9.1**		5.0	3.0	0.86	ug/L		11/22/23 08:38	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Client Sample ID: ZWM-99-24X-FAL23-SRI
Lab Sample ID: 680-243142-3

Date Collected: 11/14/23 13:40
Matrix: Water
Date Received: 11/15/23 10:07

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	340		200	150	54	ug/L		11/21/23 08:25	1
Iron	630		100	50	20	ug/L		11/21/23 08:25	1
Manganese	67		10	5.0	1.3	ug/L		11/21/23 08:25	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	2.7	J	5.0	3.0	0.86	ug/L		11/22/23 08:53	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Job ID: 680-243142-2

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-809153/1-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 809153

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/21/23 07:42	1
Iron	50	U	100	50	20	ug/L		11/21/23 07:42	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/21/23 07:42	1

Lab Sample ID: LCS 680-809153/2-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 809153

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	5050	5090		ug/L		101	86 - 115
Iron	4990	5000		ug/L		100	87 - 115
Manganese	400	407		ug/L		102	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-809155/1-A
Matrix: Water
Analysis Batch: 809672

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 809155

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/21/23 23:08	1

Lab Sample ID: LCS 680-809155/2-A
Matrix: Water
Analysis Batch: 809672

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 809155

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	105		ug/L		105	84 - 116

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Job ID: 680-243142-2

Metals

Prep Batch: 809153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243142-1	69W-94-13-FAL23-SRI	Dissolved	Water	3005A	
680-243142-3	ZWM-99-24X-FAL23-SRI	Dissolved	Water	3005A	
MB 680-809153/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-809153/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 809155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243142-1	69W-94-13-FAL23-SRI	Dissolved	Water	3005A	
680-243142-3	ZWM-99-24X-FAL23-SRI	Dissolved	Water	3005A	
MB 680-809155/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-809155/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 809393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243142-1	69W-94-13-FAL23-SRI	Dissolved	Water	6010C	809153
680-243142-3	ZWM-99-24X-FAL23-SRI	Dissolved	Water	6010C	809153
MB 680-809153/1-A	Method Blank	Total Recoverable	Water	6010C	809153
LCS 680-809153/2-A	Lab Control Sample	Total Recoverable	Water	6010C	809153

Analysis Batch: 809672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243142-1	69W-94-13-FAL23-SRI	Dissolved	Water	6020A	809155
680-243142-3	ZWM-99-24X-FAL23-SRI	Dissolved	Water	6020A	809155
MB 680-809155/1-A	Method Blank	Total Recoverable	Water	6020A	809155
LCS 680-809155/2-A	Lab Control Sample	Total Recoverable	Water	6020A	809155

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Job ID: 680-243142-2

Client Sample ID: 69W-94-13-FAL23-SRI

Lab Sample ID: 680-243142-1

Date Collected: 11/14/23 12:25
Date Received: 11/15/23 10:07

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809153	11/20/23 06:43	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/21/23 08:20	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809155	11/20/23 06:42	RR	EET SAV
Dissolved	Analysis	6020A		1			809672	11/22/23 08:38	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: ZWM-99-24X-FAL23-SRI

Lab Sample ID: 680-243142-3

Date Collected: 11/14/23 13:40
Date Received: 11/15/23 10:07

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809153	11/20/23 06:43	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/21/23 08:25	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809155	11/20/23 06:42	RR	EET SAV
Dissolved	Analysis	6020A		1			809672	11/22/23 08:53	BJB	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243142-2
Project/Site: Fort Devens, SRI, AOC69W, Fall 2023

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

Analytical Test Method

	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC
Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023	2	4	8	9	9	9	9	9	9	7	5	10

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler
1	69W-23-01-FAL23	WG				69W-23-01	N1	2.00	12.00	1
2	69W-23-02-FAL23	WG				69W-23-02	N1	4.00	14.00	1
3	69W-23-03-FAL23	WG				69W-23-03	N1	4.00	14.00	1
4	69W-94-12-FAL23	WG				69W-94-12	N1	3.00	13.00	1
5	69W-94-13-FAL23-SRI	WG	11-14-23	1225	DC	69W-94-13	N1	3.00	13.00	1
6	69W-94-14-FAL23-SRI	WG				69W-94-14	N1	3.00	13.00	1
7	69WP-08-01-FAL23-SRI	WG				69WP-08-01	N1	10.00	13.00	1
8	69WP-13-01-FAL23-SRI	WG				69WP-13-01	N1	0.00	0.00	1
9	AOC69W-DUP02-FAL23-SRI	WG	11-14-23	1225	DC	69W-94-13	FD1	3.00	13.00	1
10	AOC69W-DUP03-FAL23-SRI	WG				ZWM-99-22X	FD1	4.60	14.63	1
11	ZWM-01-25X-FAL23-SRI	WG				ZWM-01-25X	N1	4.00	16.13	1
12	ZWM-01-26X-FAL23	WG				ZWM-01-26X	N1	4.00	16.45	1
13	ZWM-95-15X-FAL23-SRI	WG				ZWM-95-15X	N1	3.00	15.87	1
14	ZWM-95-16X-FAL23	WG				ZWM-95-16X	N1	5.67	16.30	1
15	ZWM-95-17X-FAL23	WG				ZWM-95-17X	N1	12.20	24.76	1
16	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	MS1	3.00	15.22	1
17	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	N1	3.00	15.22	1
18	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	SD1	3.00	15.22	1
19	ZWM-99-22X-FAL23-SRI	WG				ZWM-99-22X	N1	4.60	14.63	1
20	ZWM-99-23X-FAL23-SRI	WG				ZWM-99-23X	N1	3.00	14.68	1
21	ZWM-99-24X-FAL23-SRI	WG	11-14-23	1340	DC	ZWM-99-24X	N1	2.50	15.52	1

680-243142 Chain of Custody

Relinquished by: (Signature) David Quinn
Date 11-14-23
Time 1700
Received by: (Signature)

Received by Laboratory: (Signature)
Date 11/15/23
Time 1007
2-4/2.7

2/15/2024 (Rev. 1)

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

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2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
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9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

Analytical Test Method

	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC
Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023	2	4	8	9	9	9	9	9	9	7	5	10

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
22	ZWP-95-01X-FAL23	WG				ZWP-95-01X	N1	10.00	14.41	1	
23	ZWP-95-02X-FAL23	WG				ZWP-95-02X	N1	9.50	14.42	1	
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											

Turnaround Time: Standard

Relinquished by: (Signature)
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature)
Date
Time

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243142-2

Login Number: 243142
List Number: 1
Creator: Johnson, Corey M

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 12/29/2023 4:32:06 PM Revision 1

JOB DESCRIPTION

Fort Devens, SRI, AOC69W Fall 2023

JOB NUMBER

680-243154-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

Generated
12/29/2023 4:32:06 PM
Revision 1

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Qualifiers

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243154-2
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-243154-4	69WP-08-01-FAL23	Water	11/16/23 14:00	11/17/23 10:14
680-243154-5	69WP-13-01-FAL23	Water	11/16/23 15:23	11/17/23 10:14
680-243154-6	AOC69W-DUP03-FAL23	Water	11/16/23 09:10	11/17/23 10:14
680-243154-7	ZWM-01-25X-FAL23	Water	11/16/23 10:36	11/17/23 10:14
680-243154-11	ZWM-95-18X-FAL23	Water	11/16/23 11:25	11/17/23 10:14
680-243154-12	ZWM-99-22X-FAL23	Water	11/16/23 09:10	11/17/23 10:14
680-243154-13	ZWM-99-23X-FAL23	Water	11/16/23 09:10	11/17/23 10:14

Job ID: 680-243154-2 — Eurofins Savannah

Job Narrative
680-243154-2

REVISION

The report being provided is a revision of the original report sent on 12/27/2023. The report (revision 1) is being revised due to Case Narrative update required..

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/17/2023 10:14 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 1.3°C, 2.8°C, 4.6°C and 5.1°C

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Job ID: 680-243154-2
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Client Sample ID: 69WP-08-01-FAL23
Lab Sample ID: 680-243154-4
Date Collected: 11/16/23 14:00
Matrix: Water
Date Received: 11/17/23 10:14

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	**6400**		100	50	20	ug/L		11/20/23 20:30	1
Manganese	**370**		10	5.0	1.3	ug/L		11/20/23 20:30	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/22/23 18:50	1

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243154-2
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Client Sample ID: 69WP-13-01-FAL23
Lab Sample ID: 680-243154-5
Date Collected: 11/16/23 15:23
Matrix: Water
Date Received: 11/17/23 10:14

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	30		10	5.0	1.3	ug/L		11/20/23 20:39	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: AOC69W-DUP03-FAL23

Date Collected: 11/16/23 09:10
Date Received: 11/17/23 10:14

Lab Sample ID: 680-243154-6

Matrix: Water

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	11000		100	50	20	ug/L		11/20/23 20:42	1
Manganese	1100		10	5.0	1.3	ug/L		11/20/23 20:42	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	120		5.0	3.0	0.86	ug/L		11/22/23 19:02	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: ZWM-01-25X-FAL23
Date Collected: 11/16/23 10:36
Date Received: 11/17/23 10:14

Lab Sample ID: 680-243154-7
Matrix: Water

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/20/23 20:44	1
Manganese	**1100**		10	5.0	1.3	ug/L		11/20/23 20:44	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.1**	**J**	5.0	3.0	0.86	ug/L		11/22/23 19:06	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: ZWM-95-18X-FAL23

Date Collected: 11/16/23 11:25
Date Received: 11/17/23 10:14

Lab Sample ID: 680-243154-11

Matrix: Water

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/20/23 20:11	1
Manganese	**61**	**J1**	10	5.0	1.3	ug/L		11/20/23 20:11	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.1**	**J**	5.0	3.0	0.86	ug/L		11/22/23 18:09	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: ZWM-99-22X-FAL23
Date Collected: 11/16/23 09:10
Date Received: 11/17/23 10:14

Lab Sample ID: 680-243154-12
Matrix: Water

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	11000		100	50	20	ug/L		11/20/23 20:54	1
Manganese	1000		10	5.0	1.3	ug/L		11/20/23 20:54	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	110		5.0	3.0	0.86	ug/L		11/22/23 19:31	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: ZWM-99-23X-FAL23
Date Collected: 11/16/23 09:10
Date Received: 11/17/23 10:14

Lab Sample ID: 680-243154-13
Matrix: Water

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	2100		100	50	20	ug/L		11/20/23 20:32	1
Manganese	1300		10	5.0	1.3	ug/L		11/20/23 20:32	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	23		5.0	3.0	0.86	ug/L		11/22/23 18:54	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-809152/1-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 809152

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/20/23 20:01	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/20/23 20:01	1

Lab Sample ID: LCS 680-809152/2-A
Matrix: Water
Analysis Batch: 809393

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 809152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4990	4860		ug/L		97	87 - 115
Manganese	400	389		ug/L		97	90 - 114

Lab Sample ID: 680-243154-11 MS
Matrix: Water
Analysis Batch: 809393

Client Sample ID: ZWM-95-18X-FAL23
Prep Type: Dissolved
Prep Batch: 809152

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	50	U	4990	4840		ug/L		97	87 - 115
Manganese	61	J1	400	388	J1	ug/L		82	90 - 114

Lab Sample ID: 680-243154-11 MSD
Matrix: Water
Analysis Batch: 809393

Client Sample ID: ZWM-95-18X-FAL23
Prep Type: Dissolved
Prep Batch: 809152

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	50	U	4990	4860		ug/L		97	87 - 115	0	20
Manganese	61	J1	400	438		ug/L		94	90 - 114	12	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-809539/1-A
Matrix: Water
Analysis Batch: 809864

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 809539

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/22/23 18:01	1

Lab Sample ID: LCS 680-809539/2-A
Matrix: Water
Analysis Batch: 809864

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 809539

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	101		ug/L		101	84 - 116

Lab Sample ID: 680-243154-11 MS
Matrix: Water
Analysis Batch: 809864

Client Sample ID: ZWM-95-18X-FAL23
Prep Type: Dissolved
Prep Batch: 809539

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.1	J	100	106		ug/L		105	84 - 116

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-243154-11 MSD
Matrix: Water
Analysis Batch: 809864

Client Sample ID: ZWM-95-18X-FAL23
Prep Type: Dissolved
Prep Batch: 809539

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.1	J	100	102		ug/L		101	84 - 116	4	20

Metals

Prep Batch: 809152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243154-4	69WP-08-01-FAL23	Dissolved	Water	3005A	
680-243154-5	69WP-13-01-FAL23	Dissolved	Water	3005A	
680-243154-6	AOC69W-DUP03-FAL23	Dissolved	Water	3005A	
680-243154-7	ZWM-01-25X-FAL23	Dissolved	Water	3005A	
680-243154-11	ZWM-95-18X-FAL23	Dissolved	Water	3005A	
680-243154-12	ZWM-99-22X-FAL23	Dissolved	Water	3005A	
680-243154-13	ZWM-99-23X-FAL23	Dissolved	Water	3005A	
MB 680-809152/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-809152/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-243154-11 MS	ZWM-95-18X-FAL23	Dissolved	Water	3005A	
680-243154-11 MSD	ZWM-95-18X-FAL23	Dissolved	Water	3005A	

Analysis Batch: 809393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243154-4	69WP-08-01-FAL23	Dissolved	Water	6010C	809152
680-243154-5	69WP-13-01-FAL23	Dissolved	Water	6010C	809152
680-243154-6	AOC69W-DUP03-FAL23	Dissolved	Water	6010C	809152
680-243154-7	ZWM-01-25X-FAL23	Dissolved	Water	6010C	809152
680-243154-11	ZWM-95-18X-FAL23	Dissolved	Water	6010C	809152
680-243154-12	ZWM-99-22X-FAL23	Dissolved	Water	6010C	809152
680-243154-13	ZWM-99-23X-FAL23	Dissolved	Water	6010C	809152
MB 680-809152/1-A	Method Blank	Total Recoverable	Water	6010C	809152
LCS 680-809152/2-A	Lab Control Sample	Total Recoverable	Water	6010C	809152
680-243154-11 MS	ZWM-95-18X-FAL23	Dissolved	Water	6010C	809152
680-243154-11 MSD	ZWM-95-18X-FAL23	Dissolved	Water	6010C	809152

Prep Batch: 809539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243154-4	69WP-08-01-FAL23	Dissolved	Water	3005A	
680-243154-6	AOC69W-DUP03-FAL23	Dissolved	Water	3005A	
680-243154-7	ZWM-01-25X-FAL23	Dissolved	Water	3005A	
680-243154-11	ZWM-95-18X-FAL23	Dissolved	Water	3005A	
680-243154-12	ZWM-99-22X-FAL23	Dissolved	Water	3005A	
680-243154-13	ZWM-99-23X-FAL23	Dissolved	Water	3005A	
MB 680-809539/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-809539/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-243154-11 MS	ZWM-95-18X-FAL23	Dissolved	Water	3005A	
680-243154-11 MSD	ZWM-95-18X-FAL23	Dissolved	Water	3005A	

Analysis Batch: 809864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243154-4	69WP-08-01-FAL23	Dissolved	Water	6020A	809539
680-243154-6	AOC69W-DUP03-FAL23	Dissolved	Water	6020A	809539
680-243154-7	ZWM-01-25X-FAL23	Dissolved	Water	6020A	809539
680-243154-11	ZWM-95-18X-FAL23	Dissolved	Water	6020A	809539
680-243154-12	ZWM-99-22X-FAL23	Dissolved	Water	6020A	809539
680-243154-13	ZWM-99-23X-FAL23	Dissolved	Water	6020A	809539
MB 680-809539/1-A	Method Blank	Total Recoverable	Water	6020A	809539
LCS 680-809539/2-A	Lab Control Sample	Total Recoverable	Water	6020A	809539
680-243154-11 MS	ZWM-95-18X-FAL23	Dissolved	Water	6020A	809539
680-243154-11 MSD	ZWM-95-18X-FAL23	Dissolved	Water	6020A	809539

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: 69WP-08-01-FAL23

Lab Sample ID: 680-243154-4
Date Collected: 11/16/23 14:00
Matrix: Water
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:30	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 18:50	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: 69WP-13-01-FAL23

Lab Sample ID: 680-243154-5
Date Collected: 11/16/23 15:23
Matrix: Water
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:39	BCB	EET SAV
	Instrument ID: ICPH									

Client Sample ID: AOC69W-DUP03-FAL23

Lab Sample ID: 680-243154-6
Date Collected: 11/16/23 09:10
Matrix: Water
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:42	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 19:02	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: ZWM-01-25X-FAL23

Lab Sample ID: 680-243154-7
Date Collected: 11/16/23 10:36
Matrix: Water
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:44	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 19:06	BJB	EET SAV
	Instrument ID: ICPMSC									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Client Sample ID: ZWM-95-18X-FAL23

Lab Sample ID: 680-243154-11
Matrix: Water
Date Collected: 11/16/23 11:25
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:11	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 18:09	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: ZWM-99-22X-FAL23

Lab Sample ID: 680-243154-12
Matrix: Water
Date Collected: 11/16/23 09:10
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:54	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 19:31	BJB	EET SAV
	Instrument ID: ICPMSC									

Client Sample ID: ZWM-99-23X-FAL23

Lab Sample ID: 680-243154-13
Matrix: Water
Date Collected: 11/16/23 09:10
Date Received: 11/17/23 10:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			25 mL	25 mL	809152	11/20/23 06:10	RR	EET SAV
Dissolved	Analysis	6010C		1			809393	11/20/23 20:32	BCB	EET SAV
	Instrument ID: ICPH									
Dissolved	Prep	3005A			25 mL	125 mL	809539	11/21/23 16:12	BCB	EET SAV
Dissolved	Analysis	6020A		1			809864	11/22/23 18:54	BJB	EET SAV
	Instrument ID: ICPMSC									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243154-2
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, SRI, AOC69W Fall 2023

Job ID: 680-243154-2

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

	Sample ID	Matrix	Date	Time	Samp Init.	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
	Analytical Test Method					2	4	8	9	9	9	9	9	9	7	5	10						
	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023																						
1	69W-23-01-FAL23	WG	11-16-23	1100	DC	X	X	X	X			X	X	X	X	X	X	69W-23-01	N1	2.00	12.00	1	
2	69W-23-02-FAL23	WG	11-16-23	0940	AF	X	X	X	X			X	X	X	X	X	X	69W-23-02	N1	4.00	14.00	1	
3	69W-23-03-FAL23	WG	11-16-23	1320	DC	X	X	X	X			X	X	X	X	X	X	69W-23-03	N1	4.00	14.00	1	
4	69W-94-12-FAL23	WG				X	X	X	X			X	X	X	X	X	X	69W-94-12	N1	3.00	13.00	1	
5	69W-94-13-FAL23-SRI	WG					X	X	X		X		X		X	X	X	69W-94-13	N1	3.00	13.00	1	
6	69W-94-14-FAL23-SRI	WG					X	X	X		X		X		X	X	X	69W-94-14	N1	3.00	13.00	1	
7	69WP-08-01-FAL23-SRI	WG	11-16-23	1400	FM	X	X	X	X		X		X		X	X	X	69WP-08-01	N1	10.00	13.00	1	
8	69WP-13-01-FAL23-SRI	WG	11-16-23	1523	MS	X	X	X	X	X			X	X	X	X	X	69WP-13-01	N1	0.00	0.00	1	
9	AOC69W-DUP02-FAL23-SRI	WG					X		X		X		X					69W-94-13	FD1	3.00	13.00	1	
10	AOC69W-DUP03-FAL23-SRI	WG	11-16-23	0910	DC		X		X		X		X					ZWM-99-22X	FD1	4.60	14.63	1	
11	ZWM-01-25X-FAL23-SRI	WG	11-16-23	1036	MS		X	X	X		X		X		X	X	X	ZWM-01-25X	N1	4.00	16.13	1	
12	ZWM-01-26X-FAL23	WG	11-16-23	1234	MS	X	X	X	X			X	X	X	X	X	X	ZWM-01-26X	N1	4.00	16.45	1	
13	ZWM-95-15X-FAL23-SRI	WG					X	X	X		X		X		X	X	X	ZWM-95-15X	N1	3.00	15.87	1	
14	ZWM-95-16X-FAL23	WG	11-16-23	1350	AF	X	X	X	X			X	X	X	X	X	X	ZWM-95-16X	N1	5.67	16.30	1	
15	ZWM-95-17X-FAL23	WG	11-16-23	1140	AF	X	X	X	X			X	X	X	X	X	X	ZWM-95-17X	N1	12.20	24.76	1	
16	ZWM-95-18X-FAL23-SRI	WG	11-16-23	1125	FM		X		X		X		X					ZWM-95-18X	MS1	3.00	15.22	1	
17	ZWM-95-18X-FAL23-SRI	WG	11-16-23	1125	FM		X	X	X		X		X		X	X	X	ZWM-95-18X	N1	3.00	15.22	1	
18	ZWM-95-18X-FAL23-SRI	WG	11-16-23	1125	FM		X		X		X		X					ZWM-95-18X	SD1	3.00	15.22	1	
19	ZWM-99-22X-FAL23-SRI	WG	11-16-23	0910	DC		X	X	X		X		X		X	X	X	ZWM-99-22X	N1	4.60	14.63	1	
20	ZWM-99-23X-FAL23-SRI	WG	11-16-23	0910	MS		X	X	X		X		X		X	X	X	ZWM-99-23X	N1	3.00	14.68	1	
21	ZWM-99-24X-FAL23-SRI	WG					X	X	X		X		X		X	X	X	ZWM-99-24X	N1	2.50	15.52	1	

680-243154 Chain of Custody

Relinquished by: (Signature) Diane Clyne 11/16/23 1700
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) [signature] TA 10-17-23 1014
Date
Time 1.0/1.3 4.3/4.6 4.8/5.1 2.5/2.8

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023

	Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
							2	4	8	9	9	9	9	9	9	7	5	10						
22	ZWP-95-01X-FAL23	WG	11-16-23	0935	FM		X	X	X	X			X	X	X	X	X	X	ZWP-95-01X	N1	10.00	14.41	1	
23	ZWP-95-02X-FAL23	WG					X	X	X	X			X	X	X	X	X	X	ZWP-95-02X	N1	9.50	14.42	1	
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
32																								
33																								

Turnaround Time: Standard

Relinquished by: (Signature) Dawn Clayton
Date 11/16/23
Time 1700
Received by: (Signature)

Received by Laboratory: (Signature) JA
Date 11.17.23
Time 1014

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243154-2

Login Number: 243154
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 12/27/2023 5:39:45 PM

JOB DESCRIPTION

Seres-Arcadis JV Supp. Rem. Inv AOC 69W Fall2023

JOB NUMBER

680-243266-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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12/27/2023 5:39:45 PM

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-243266-1	69W-94-13-FAL23	Water	11/17/23 12:20	11/21/23 10:28
680-243266-2	69W-94-14-FAL23	Water	11/17/23 12:30	11/21/23 10:28
680-243266-3	ZWM-01-25X-FAL23	Water	11/17/23 12:47	11/21/23 10:28
680-243266-4	ZWM-95-15X-FAL23	Water	11/17/23 12:37	11/21/23 10:28
680-243266-6	ZWM-99-22X-FAL23	Water	11/17/23 12:49	11/21/23 10:28
680-243266-7	ZWM-99-23X-FAL23	Water	11/17/23 12:20	11/21/23 10:28
680-243266-8	ZWM-99-24X-FAL23	Water	11/17/23 12:30	11/21/23 10:28

Job ID: 680-243266-2 Eurofins Savannah

680-243154-1

- Separate the following into a separate login and remove "-SRI" from the ends of the sample IDs:
  - 69W-94-13-FAL23: EPH
  - 69W-94-14-FAL23: EPH
  - ZWM-01-25X-FAL23: EPH
  - ZWM-95-15X-FAL23: EPH
  - ZWM-99-22X-FAL23: EPH
  - ZWM-99-23X-FAL23: EPH
  - ZWM-99-24X-FAL23: EPH

Client Sample ID: 69W-94-13-FAL23
Lab Sample ID: 680-243266-1

Date Collected: 11/17/23 12:20
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Pyrene	9.4	U Q	11	9.4	4.7	ug/L		12/05/23 11:48	1
Benzo[g,h,i]perylene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Indeno[1,2,3-cd]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Benzo[b]fluoranthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Fluoranthene	0.94	U Q	1.9	0.94	0.47	ug/L		12/05/23 11:48	1
Benzo[k]fluoranthene	2.8	U Q	3.8	2.8	1.4	ug/L		12/05/23 11:48	1
Acenaphthylene	1.3	U Q	1.9	1.3	0.66	ug/L		12/05/23 11:48	1
Chrysene	0.94	U Q	1.9	0.94	0.47	ug/L		12/05/23 11:48	1
Benzo[a]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Dibenz(a,h)anthracene	0.94	U Q	1.9	0.94	0.47	ug/L		12/05/23 11:48	1
Benzo[a]anthracene	1.3	U Q	1.9	1.3	0.66	ug/L		12/05/23 11:48	1
Acenaphthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Phenanthrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Fluorene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
Naphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
2-Methylnaphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 11:48	1
C11-C22 Aromatics (unadjusted)	**10**	**J Q**	38	28	9.4	ug/L		12/05/23 11:48	1
C11-C22 Aromatics (Adjusted)	**9.4**	**J**	38	28	9.4	ug/L		12/05/23 11:48	1
C19-C36 Aliphatics	19	U Q	47	19	9.4	ug/L		12/05/23 11:48	1
C9-C18 Aliphatics	57	U	85	57	28	ug/L		12/05/23 11:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*67*		*40 - 140*	*11/29/23 08:54*	*12/05/23 11:48*	*1*
2-Fluorobiphenyl (Surr)	*100*		*40 - 140*	*11/29/23 08:54*	*12/05/23 11:48*	*1*
o- terphenyl (Surr)	*87*		*40 - 140*	*11/29/23 08:54*	*12/05/23 11:48*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: 69W-94-14-FAL23
Lab Sample ID: 680-243266-2
Date Collected: 11/17/23 12:30
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Pyrene	9.5	U Q	11	9.5	4.7	ug/L		12/05/23 12:11	1
Benzo[g,h,i]perylene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Indeno[1,2,3-cd]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Benzo[b]fluoranthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Fluoranthene	0.95	U Q	1.9	0.95	0.47	ug/L		12/05/23 12:11	1
Benzo[k]fluoranthene	2.8	U Q	3.8	2.8	1.4	ug/L		12/05/23 12:11	1
Acenaphthylene	1.3	U Q	1.9	1.3	0.66	ug/L		12/05/23 12:11	1
Chrysene	0.95	U Q	1.9	0.95	0.47	ug/L		12/05/23 12:11	1
Benzo[a]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Dibenz(a,h)anthracene	0.95	U Q	1.9	0.95	0.47	ug/L		12/05/23 12:11	1
Benzo[a]anthracene	1.3	U Q	1.9	1.3	0.66	ug/L		12/05/23 12:11	1
Acenaphthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Phenanthrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Fluorene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
Naphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
2-Methylnaphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:11	1
C11-C22 Aromatics (unadjusted)	28	U Q	38	28	9.5	ug/L		12/05/23 12:11	1
C11-C22 Aromatics (Adjusted)	28	U	38	28	9.5	ug/L		12/05/23 12:11	1
C19-C36 Aliphatics	**9.8**	**J Q**	47	19	9.5	ug/L		12/05/23 12:11	1
C9-C18 Aliphatics	57	U M	85	57	28	ug/L		12/05/23 12:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*66*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:11*	*1*
2-Fluorobiphenyl (Surr)	*99*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:11*	*1*
o- terphenyl (Surr)	*86*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:11*	*1*

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-01-25X-FAL23
Date Collected: 11/17/23 12:47
Date Received: 11/21/23 10:28

Lab Sample ID: 680-243266-3
Matrix: Water

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Pyrene	9.7	U Q	12	9.7	4.9	ug/L		12/05/23 12:33	1
Benzo[g,h,i]perylene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Indeno[1,2,3-cd]pyrene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Benzo[b]fluoranthene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Fluoranthene	0.97	U Q	1.9	0.97	0.49	ug/L		12/05/23 12:33	1
Benzo[k]fluoranthene	2.9	U Q	3.9	2.9	1.5	ug/L		12/05/23 12:33	1
Acenaphthylene	1.4	U Q	1.9	1.4	0.68	ug/L		12/05/23 12:33	1
Chrysene	0.97	U Q	1.9	0.97	0.49	ug/L		12/05/23 12:33	1
Benzo[a]pyrene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Dibenz(a,h)anthracene	0.97	U Q	1.9	0.97	0.49	ug/L		12/05/23 12:33	1
Benzo[a]anthracene	1.4	U Q	1.9	1.4	0.68	ug/L		12/05/23 12:33	1
Acenaphthene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Phenanthrene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Fluorene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
Naphthalene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
2-Methylnaphthalene	1.2	U Q	1.9	1.2	0.58	ug/L		12/05/23 12:33	1
C11-C22 Aromatics (unadjusted)	29	U Q	39	29	9.7	ug/L		12/05/23 12:33	1
C11-C22 Aromatics (Adjusted)	29	U	39	29	9.7	ug/L		12/05/23 12:33	1
C19-C36 Aliphatics	**11**	**J Q**	49	19	9.7	ug/L		12/05/23 12:33	1
C9-C18 Aliphatics	58	U M	88	58	29	ug/L		12/05/23 12:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*66*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:33*	*1*
2-Fluorobiphenyl (Surr)	*83*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:33*	*1*
o- terphenyl (Surr)	*72*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:33*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-95-15X-FAL23
Lab Sample ID: 680-243266-4
Date Collected: 11/17/23 12:37
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Pyrene	9.5	U Q	11	9.5	4.8	ug/L		12/05/23 12:56	1
Benzo[g,h,i]perylene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Indeno[1,2,3-cd]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Benzo[b]fluoranthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Fluoranthene	0.95	U Q	1.9	0.95	0.48	ug/L		12/05/23 12:56	1
Benzo[k]fluoranthene	2.9	U Q	3.8	2.9	1.4	ug/L		12/05/23 12:56	1
Acenaphthylene	1.3	U Q	1.9	1.3	0.67	ug/L		12/05/23 12:56	1
Chrysene	0.95	U Q	1.9	0.95	0.48	ug/L		12/05/23 12:56	1
Benzo[a]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Dibenz(a,h)anthracene	0.95	U Q	1.9	0.95	0.48	ug/L		12/05/23 12:56	1
Benzo[a]anthracene	1.3	U Q	1.9	1.3	0.67	ug/L		12/05/23 12:56	1
Acenaphthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Phenanthrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Fluorene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
Naphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
2-Methylnaphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 12:56	1
C11-C22 Aromatics (unadjusted)	**13**	**J Q**	38	29	9.5	ug/L		12/05/23 12:56	1
C11-C22 Aromatics (Adjusted)	**13**	**J**	38	29	9.5	ug/L		12/05/23 12:56	1
C19-C36 Aliphatics	**11**	**J Q**	48	19	9.5	ug/L		12/05/23 12:56	1
C9-C18 Aliphatics	57	U M	86	57	29	ug/L		12/05/23 12:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*69*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:56*	*1*
2-Fluorobiphenyl (Surr)	*92*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:56*	*1*
o- terphenyl (Surr)	*83*		*40 - 140*	*11/29/23 08:54*	*12/05/23 12:56*	*1*

Client Sample Results

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-99-22X-FAL23
Lab Sample ID: 680-243266-6

Date Collected: 11/17/23 12:49
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	**0.97**	**J M Q**	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Pyrene	9.5	U M Q	11	9.5	4.7	ug/L		12/05/23 13:41	1
Benzo[g,h,i]perylene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Indeno[1,2,3-cd]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Benzo[b]fluoranthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Fluoranthene	0.95	U M Q	1.9	0.95	0.47	ug/L		12/05/23 13:41	1
Benzo[k]fluoranthene	2.8	U Q	3.8	2.8	1.4	ug/L		12/05/23 13:41	1
Acenaphthylene	**2.1**	**M Q**	1.9	1.3	0.66	ug/L		12/05/23 13:41	1
Chrysene	0.95	U M Q	1.9	0.95	0.47	ug/L		12/05/23 13:41	1
Benzo[a]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Dibenz(a,h)anthracene	0.95	U Q	1.9	0.95	0.47	ug/L		12/05/23 13:41	1
Benzo[a]anthracene	1.3	U M Q	1.9	1.3	0.66	ug/L		12/05/23 13:41	1
Acenaphthene	**1.2**	**J M Q**	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Phenanthrene	**0.72**	**J M Q**	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Fluorene	**1.4**	**J M Q**	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
Naphthalene	1.1	U M Q	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
2-Methylnaphthalene	**2.2**	**M Q**	1.9	1.1	0.57	ug/L		12/05/23 13:41	1
C11-C22 Aromatics (unadjusted)	**110**	**M Q**	38	28	9.5	ug/L		12/05/23 13:41	1
C11-C22 Aromatics (Adjusted)	**100**		38	28	9.5	ug/L		12/05/23 13:41	1
C19-C36 Aliphatics	19	U Q	47	19	9.5	ug/L		12/05/23 13:41	1
C9-C18 Aliphatics	57	U M	85	57	28	ug/L		12/05/23 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*56*		*40 - 140*	*11/29/23 08:54*	*12/05/23 13:41*	*1*
2-Fluorobiphenyl (Surr)	*100*		*40 - 140*	*11/29/23 08:54*	*12/05/23 13:41*	*1*
o- terphenyl (Surr)	*75*		*40 - 140*	*11/29/23 08:54*	*12/05/23 13:41*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-99-23X-FAL23
Lab Sample ID: 680-243266-7
Date Collected: 11/17/23 12:20
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Pyrene	10	U Q	13	10	5.2	ug/L		12/05/23 14:04	1
Benzo[g,h,i]perylene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Indeno[1,2,3-cd]pyrene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Benzo[b]fluoranthene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Fluoranthene	1.0	U Q	2.1	1.0	0.52	ug/L		12/05/23 14:04	1
Benzo[k]fluoranthene	3.1	U Q	4.2	3.1	1.6	ug/L		12/05/23 14:04	1
Acenaphthylene	1.5	U Q	2.1	1.5	0.73	ug/L		12/05/23 14:04	1
Chrysene	1.0	U Q	2.1	1.0	0.52	ug/L		12/05/23 14:04	1
Benzo[a]pyrene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Dibenz(a,h)anthracene	1.0	U Q	2.1	1.0	0.52	ug/L		12/05/23 14:04	1
Benzo[a]anthracene	1.5	U Q	2.1	1.5	0.73	ug/L		12/05/23 14:04	1
Acenaphthene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Phenanthrene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Fluorene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
Naphthalene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
2-Methylnaphthalene	1.3	U Q	2.1	1.3	0.63	ug/L		12/05/23 14:04	1
C11-C22 Aromatics (unadjusted)	**24**	**J Q**	42	31	10	ug/L		12/05/23 14:04	1
C11-C22 Aromatics (Adjusted)	**23**	**J**	42	31	10	ug/L		12/05/23 14:04	1
C19-C36 Aliphatics	**10**	**J Q**	52	21	10	ug/L		12/05/23 14:04	1
C9-C18 Aliphatics	63	U	94	63	31	ug/L		12/05/23 14:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*63*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:04*	*1*
2-Fluorobiphenyl (Surr)	*81*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:04*	*1*
o- terphenyl (Surr)	*70*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:04*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-99-24X-FAL23
Lab Sample ID: 680-243266-8
Date Collected: 11/17/23 12:30
Matrix: Water
Date Received: 11/21/23 10:28

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Pyrene	9.6	U Q	11	9.6	4.8	ug/L		12/05/23 14:26	1
Benzo[g,h,i]perylene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Indeno[1,2,3-cd]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Benzo[b]fluoranthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Fluoranthene	0.96	U Q	1.9	0.96	0.48	ug/L		12/05/23 14:26	1
Benzo[k]fluoranthene	2.9	U Q	3.8	2.9	1.4	ug/L		12/05/23 14:26	1
Acenaphthylene	1.3	U Q	1.9	1.3	0.67	ug/L		12/05/23 14:26	1
Chrysene	0.96	U Q	1.9	0.96	0.48	ug/L		12/05/23 14:26	1
Benzo[a]pyrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Dibenz(a,h)anthracene	0.96	U Q	1.9	0.96	0.48	ug/L		12/05/23 14:26	1
Benzo[a]anthracene	1.3	U Q	1.9	1.3	0.67	ug/L		12/05/23 14:26	1
Acenaphthene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Phenanthrene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Fluorene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
Naphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
2-Methylnaphthalene	1.1	U Q	1.9	1.1	0.57	ug/L		12/05/23 14:26	1
C11-C22 Aromatics (unadjusted)	29	U Q	38	29	9.6	ug/L		12/05/23 14:26	1
C11-C22 Aromatics (Adjusted)	29	U	38	29	9.6	ug/L		12/05/23 14:26	1
C19-C36 Aliphatics	**13**	**J Q**	48	19	9.6	ug/L		12/05/23 14:26	1
C9-C18 Aliphatics	57	U	86	57	29	ug/L		12/05/23 14:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*62*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:26*	*1*
2-Fluorobiphenyl (Surr)	*83*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:26*	*1*
o- terphenyl (Surr)	*72*		*40 - 140*	*11/29/23 08:54*	*12/05/23 14:26*	*1*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-447864/1-B
Matrix: Water
Analysis Batch: 449888

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447864

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C19-C36 Aliphatics	20	U	50	20	10	ug/L		12/05/23 10:40	1
C9-C18 Aliphatics	60	U	90	60	30	ug/L		12/05/23 10:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*63*		*40 - 140*	*11/29/23 08:54*	*12/05/23 10:40*	*1*

Lab Sample ID: MB 410-447864/1-C
Matrix: Water
Analysis Batch: 449883

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447864

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Pyrene	10	U	12	10	5.0	ug/L		12/05/23 10:40	1
Benzo[g,h,i]perylene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Indeno[1,2,3-cd]pyrene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Benzo[b]fluoranthene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Fluoranthene	1.0	U	2.0	1.0	0.50	ug/L		12/05/23 10:40	1
Benzo[k]fluoranthene	3.0	U	4.0	3.0	1.5	ug/L		12/05/23 10:40	1
Acenaphthylene	1.4	U	2.0	1.4	0.70	ug/L		12/05/23 10:40	1
Chrysene	1.0	U	2.0	1.0	0.50	ug/L		12/05/23 10:40	1
Benzo[a]pyrene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Dibenz(a,h)anthracene	1.0	U	2.0	1.0	0.50	ug/L		12/05/23 10:40	1
Benzo[a]anthracene	1.4	U	2.0	1.4	0.70	ug/L		12/05/23 10:40	1
Acenaphthene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Phenanthrene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Fluorene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
Naphthalene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
2-Methylnaphthalene	1.2	U	2.0	1.2	0.60	ug/L		12/05/23 10:40	1
C11-C22 Aromatics (unadjusted)	30	U	40	30	10	ug/L		12/05/23 10:40	1
C11-C22 Aromatics (Adjusted)	30	U	40	30	10	ug/L		12/05/23 10:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*80*		*40 - 140*	*11/29/23 08:54*	*12/05/23 10:40*	*1*
o- terphenyl (Surr)	*72*		*40 - 140*	*11/29/23 08:54*	*12/05/23 10:40*	*1*

Lab Sample ID: LCS 410-447864/2-B
Matrix: Water
Analysis Batch: 449888

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 447864

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C19-C36 Aliphatics			321	172		ug/L		54	40 - 140		
C9-C18 Aliphatics			241	139	M	ug/L		58	40 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*46*		*40 - 140*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 410-447864/2-C
Matrix: Water
Analysis Batch: 449883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 447864

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Anthracene			40.1	21.7		ug/L		54	40 - 140		
Pyrene			40.1	22.0		ug/L		55	40 - 140		
Benzo[g,h,i]perylene			40.0	21.5		ug/L		54	40 - 140		
Indeno[1,2,3-cd]pyrene			40.1	20.6		ug/L		51	40 - 140		
Benzo[b]fluoranthene			40.2	21.8	M	ug/L		54	40 - 140		
Fluoranthene			40.1	22.3		ug/L		56	40 - 140		
Benzo[k]fluoranthene			40.1	22.2	M	ug/L		55	40 - 140		
Acenaphthylene			40.1	22.4		ug/L		56	40 - 140		
Chrysene			40.2	21.3		ug/L		53	40 - 140		
Benzo[a]pyrene			40.2	20.6		ug/L		51	40 - 140		
Dibenz(a,h)anthracene			40.0	21.5		ug/L		54	40 - 140		
Benzo[a]anthracene			40.1	21.6		ug/L		54	40 - 140		
Acenaphthene			40.2	21.2		ug/L		53	40 - 140		
Phenanthrene			40.1	22.4		ug/L		56	40 - 140		
Fluorene			40.1	22.0		ug/L		55	40 - 140		
Naphthalene			40.1	20.4		ug/L		51	40 - 140		
2-Methylnaphthalene			40.1	20.6		ug/L		51	40 - 140		
C11-C22 Aromatics (unadjusted)			681	365	M	ug/L		54	40 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*83*		*40 - 140*
o- terphenyl (Surr)	*53*		*40 - 140*

Lab Sample ID: LCSD 410-447864/3-B
Matrix: Water
Analysis Batch: 449888

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447864

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics			321	242	Q	ug/L		75	40 - 140	34	25
C9-C18 Aliphatics			241	173	M	ug/L		72	40 - 140	22	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*64*		*40 - 140*

Lab Sample ID: LCSD 410-447864/3-C
Matrix: Water
Analysis Batch: 449883

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447864

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene			40.1	31.6	Q	ug/L		79	40 - 140	37	25
Pyrene			40.1	32.2	Q	ug/L		80	40 - 140	38	25
Benzo[g,h,i]perylene			40.0	32.0	Q	ug/L		80	40 - 140	39	25
Indeno[1,2,3-cd]pyrene			40.1	31.5	M Q	ug/L		79	40 - 140	42	25
Benzo[b]fluoranthene			40.2	33.2	M Q	ug/L		83	40 - 140	41	25
Fluoranthene			40.1	32.6	Q	ug/L		81	40 - 140	37	25
Benzo[k]fluoranthene			40.1	31.9	M Q	ug/L		79	40 - 140	36	25
Acenaphthylene			40.1	32.0	M Q	ug/L		80	40 - 140	35	25

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 410-447864/3-C
Matrix: Water
Analysis Batch: 449883

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447864

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chrysene			40.2	31.4	M Q	ug/L		78	40 - 140	38	25
Benzo[a]pyrene			40.2	30.5	Q	ug/L		76	40 - 140	39	25
Dibenz(a,h)anthracene			40.0	31.1	M Q	ug/L		78	40 - 140	37	25
Benzo[a]anthracene			40.1	32.5	M Q	ug/L		81	40 - 140	40	25
Acenaphthene			40.2	30.1	Q	ug/L		75	40 - 140	34	25
Phenanthrene			40.1	32.4	Q	ug/L		81	40 - 140	36	25
Fluorene			40.1	31.3	Q	ug/L		78	40 - 140	35	25
Naphthalene			40.1	28.7	Q	ug/L		72	40 - 140	34	25
2-Methylnaphthalene			40.1	28.7	Q	ug/L		72	40 - 140	33	25
C11-C22 Aromatics (unadjusted)			681	530	M Q	ug/L		78	40 - 140	37	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*83*		*40 - 140*
o- terphenyl (Surr)	*76*		*40 - 140*

QC Association Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

GC Semi VOA

Prep Batch: 447864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243266-1	69W-94-13-FAL23	Total/NA	Water	3510C	
680-243266-2	69W-94-14-FAL23	Total/NA	Water	3510C	
680-243266-3	ZWM-01-25X-FAL23	Total/NA	Water	3510C	
680-243266-4	ZWM-95-15X-FAL23	Total/NA	Water	3510C	
680-243266-6	ZWM-99-22X-FAL23	Total/NA	Water	3510C	
680-243266-7	ZWM-99-23X-FAL23	Total/NA	Water	3510C	
680-243266-8	ZWM-99-24X-FAL23	Total/NA	Water	3510C	
MB 410-447864/1-B	Method Blank	Total/NA	Water	3510C	
MB 410-447864/1-C	Method Blank	Total/NA	Water	3510C	
LCS 410-447864/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-447864/2-C	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-447864/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
LCSD 410-447864/3-C	Lab Control Sample Dup	Total/NA	Water	3510C	

Cleanup Batch: 449383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243266-1	69W-94-13-FAL23	Total/NA	Water	3630C	447864
680-243266-1	69W-94-13-FAL23	Total/NA	Water	3630C	447864
680-243266-2	69W-94-14-FAL23	Total/NA	Water	3630C	447864
680-243266-2	69W-94-14-FAL23	Total/NA	Water	3630C	447864
680-243266-3	ZWM-01-25X-FAL23	Total/NA	Water	3630C	447864
680-243266-3	ZWM-01-25X-FAL23	Total/NA	Water	3630C	447864
680-243266-4	ZWM-95-15X-FAL23	Total/NA	Water	3630C	447864
680-243266-4	ZWM-95-15X-FAL23	Total/NA	Water	3630C	447864
680-243266-6	ZWM-99-22X-FAL23	Total/NA	Water	3630C	447864
680-243266-6	ZWM-99-22X-FAL23	Total/NA	Water	3630C	447864
680-243266-7	ZWM-99-23X-FAL23	Total/NA	Water	3630C	447864
680-243266-7	ZWM-99-23X-FAL23	Total/NA	Water	3630C	447864
680-243266-8	ZWM-99-24X-FAL23	Total/NA	Water	3630C	447864
680-243266-8	ZWM-99-24X-FAL23	Total/NA	Water	3630C	447864
MB 410-447864/1-B	Method Blank	Total/NA	Water	3630C	447864
MB 410-447864/1-C	Method Blank	Total/NA	Water	3630C	447864
LCS 410-447864/2-B	Lab Control Sample	Total/NA	Water	3630C	447864
LCS 410-447864/2-C	Lab Control Sample	Total/NA	Water	3630C	447864
LCSD 410-447864/3-B	Lab Control Sample Dup	Total/NA	Water	3630C	447864
LCSD 410-447864/3-C	Lab Control Sample Dup	Total/NA	Water	3630C	447864

Analysis Batch: 449883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243266-1	69W-94-13-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-2	69W-94-14-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-3	ZWM-01-25X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-4	ZWM-95-15X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-6	ZWM-99-22X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-7	ZWM-99-23X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-8	ZWM-99-24X-FAL23	Total/NA	Water	MA-EPH	449383
MB 410-447864/1-C	Method Blank	Total/NA	Water	MA-EPH	449383
LCS 410-447864/2-C	Lab Control Sample	Total/NA	Water	MA-EPH	449383
LCSD 410-447864/3-C	Lab Control Sample Dup	Total/NA	Water	MA-EPH	449383

QC Association Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

GC Semi VOA

Analysis Batch: 449888

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243266-1	69W-94-13-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-2	69W-94-14-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-3	ZWM-01-25X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-4	ZWM-95-15X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-6	ZWM-99-22X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-7	ZWM-99-23X-FAL23	Total/NA	Water	MA-EPH	449383
680-243266-8	ZWM-99-24X-FAL23	Total/NA	Water	MA-EPH	449383
MB 410-447864/1-B	Method Blank	Total/NA	Water	MA-EPH	449383
LCS 410-447864/2-B	Lab Control Sample	Total/NA	Water	MA-EPH	449383
LCSD 410-447864/3-B	Lab Control Sample Dup	Total/NA	Water	MA-EPH	449383

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: 69W-94-13-FAL23
Lab Sample ID: 680-243266-1
Date Collected: 11/17/23 12:20
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1058.7 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 11:48	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1058.7 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 11:48	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: 69W-94-14-FAL23
Lab Sample ID: 680-243266-2
Date Collected: 11/17/23 12:30
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1057.4 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 12:11	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1057.4 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 12:11	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: ZWM-01-25X-FAL23
Lab Sample ID: 680-243266-3
Date Collected: 11/17/23 12:47
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1026.2 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 12:33	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1026.2 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 12:33	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: ZWM-95-15X-FAL23
Lab Sample ID: 680-243266-4
Date Collected: 11/17/23 12:37
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1049 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 12:56	UHEW	ELLE
	Instrument ID: 18433-W									

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Client Sample ID: ZWM-95-15X-FAL23
Lab Sample ID: 680-243266-4
Date Collected: 11/17/23 12:37
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1049 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 12:56	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: ZWM-99-22X-FAL23
Lab Sample ID: 680-243266-6
Date Collected: 11/17/23 12:49
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1057 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 13:41	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1057 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 13:41	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: ZWM-99-23X-FAL23
Lab Sample ID: 680-243266-7
Date Collected: 11/17/23 12:20
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			957.8 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 14:04	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			957.8 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 14:04	UHEW	ELLE
	Instrument ID: 18433-X									

Client Sample ID: ZWM-99-24X-FAL23
Lab Sample ID: 680-243266-8
Date Collected: 11/17/23 12:30
Matrix: Water
Date Received: 11/21/23 10:28

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1046.4 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449883	12/05/23 14:26	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1046.4 mL	1 mL	447864	11/29/23 08:54	U7CG	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	449383	12/02/23 07:31	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	449888	12/05/23 14:26	UHEW	ELLE
	Instrument ID: 18433-X									

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243266-2
Project/Site: Seres-Arcadis JV Supp. Rem. Inv AOC 69W
Fall2023

Method	Method Description	Protocol	Laboratory
MA-EPH	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3630C	Silica Gel Cleanup	SW846	ELLE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool

680-243266 Chain of Custody

Analytical Test Method

		MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC
	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023	2	4	8	9	9	9	9	9	9	7	5	10

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	69W-23-01-FAL23	WG				69W-23-01	N1	2.00	12.00	1	
2	69W-23-02-FAL23	WG				69W-23-02	N1	4.00	14.00	1	
3	69W-23-03-FAL23	WG				69W-23-03	N1	4.00	14.00	1	
4	69W-94-12-FAL23	WG				69W-94-12	N1	3.00	13.00	1	
5	69W-94-13-FAL23-SRI	WG	11-17-23	1220	MS	69W-94-13	N1	3.00	13.00	1	EPH only
6	69W-94-14-FAL23-SRI	WG	11-17-23	1230	AF	69W-94-14	N1	3.00	13.00	1	EPH only
7	69WP-08-01-FAL23-SRI	WG				69WP-08-01	N1	10.00	13.00	1	
8	69WP-13-01-FAL23-SRI	WG				69WP-13-01	N1	0.00	0.00	1	
9	AOC69W-DUP02-FAL23-SRI	WG				69W-94-13	FD1	3.00	13.00	1	
10	AOC69W-DUP03-FAL23-SRI	WG				ZWM-99-22X	FD1	4.60	14.63	1	
11	ZWM-01-25X-FAL23-SRI	WG	11-17-23	1247	MS	ZWM-01-25X	N1	4.00	16.13	1	EPH only
12	ZWM-01-26X-FAL23	WG				ZWM-01-26X	N1	4.00	16.45	1	
13	ZWM-95-15X-FAL23-SRI	WG	11-17-23	1237	AF	ZWM-95-15X	N1	3.00	15.87	1	EPH only
14	ZWM-95-16X-FAL23	WG				ZWM-95-16X	N1	5.67	16.30	1	
15	ZWM-95-17X-FAL23	WG				ZWM-95-17X	N1	12.20	24.76	1	
16	ZWM-95-18X-FAL23-SRI	WG	11-17-23	1240	FM	ZWM-95-18X	MS1	3.00	15.22	1	EPH only
17	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	N1	3.00	15.22	1	
18	ZWM-95-18X-FAL23-SRI	WG				ZWM-95-18X	SD1	3.00	15.22	1	
19	ZWM-99-22X-FAL23-SRI	WG	11-17-23	1249	MS	ZWM-99-22X	N1	4.60	14.63	1	EPH only
20	ZWM-99-23X-FAL23-SRI	WG	11-17-23	1220	FM	ZWM-99-23X	N1	3.00	14.68	1	EPH Only
21	ZWM-99-24X-FAL23-SRI	WG	11-17-23	1230	FM	ZWM-99-24X	N1	2.50	15.52	1	EPH only

2.0/2.3 0.1/0.4

Relinquished by: (Signature) Drew Clapper
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) C. Munro
Date 11/21/23
Time 1028

12/27/2023

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478.0336, jennifer.singer@arcadis.com

COC # 69W-SRI-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023
Project Number: DEVNS-LTM PO 2106 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
RSK175 (A) = Dissolved Gases
SW6010C (L) = Al Fe Mn
SW6010C/FLDFLT (J) = Al Fe
SW6010C/FLDFLT (K) = Al
SW6010C/FLDFLT (L) = Al Fe Mn
SW6020B/FLDFLT (B) = As
SW9034 (A) = Sulfide

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
8	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
7	2x 250mL plastic, ZnAc/NaOH Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
10	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC

Event: Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 69W, Fall 2023

	Sample ID	Matrix	Date	Time	Samp Init.	MADEPEP (A)	MADEPVP (A)	RSK175 (A)	SW6010C (L)	SW6010C/FLDFLT (J)	SW6010C/FLDFLT (K)	SW6010C/FLDFLT (L)	SW6020B - As	SW6020B/FLDFLT (B)	SW9034 (A)	SW9056A - SO4, NO2, NO3	SW9060A - TOC	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
	Analytical Test Method					2	4	8	9	9	9	9	9	9	7	5	10						
22	ZWP-95-01X-FAL23	WG				X	X	X	X			X	X	X	X	X	X	ZWP-95-01X	N1	10.00	14.41	1	
23	ZWP-95-02X-FAL23	WG	11-17-23	0920	FM	X	X	X	X			X	X	X	X	X	X	ZWP-95-02X	N1	9.50	14.42	1	
24																							
25																							
26																							
27																							
28																							
29																							
30																							
31																							
32																							
33																							

Turnaround Time: Standard

2.0/2.3 0.1/0.4

Relinquished by: (Signature) 11/17/23 1400
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) C. Myrick 11/21/23 1028
Date
Time

12/27/2023

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243266-2

Login Number: 243266
List Number: 1
Creator: Munro, Caroline

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243266-2

Login Number: 243266
List Number: 2
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/28/23 11:51 AM

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 11/30/2023 7:52:59 PM

JOB DESCRIPTION

Seres-Arcadis JV, LTM DCL Leach, Fall 2023

JOB NUMBER

680-242837-1

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242837-1	DCL LEACHATE-FAL23	Water	11/07/23 10:40	11/10/23 10:06

Job ID: 680-242837-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-242837-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 11/10/2023 10:06 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.5°C

GC/MS VOA
Method 624_5ml_DOD5: The following sample in batch 280-635040 was received one day outside of holding time due to a shipping delay: DCL LEACHATE-FAL23 (680-242837-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Pesticides/PCBs
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1
Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

Method: EPA 624 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.50	U H	1.0	0.50	0.39	ug/L		11/22/23 20:10	1
1,1,2,2-Tetrachloroethane	0.80	U H	1.0	0.80	0.21	ug/L		11/22/23 20:10	1
1,1,2-Trichloroethane	0.80	U H	1.0	0.80	0.27	ug/L		11/22/23 20:10	1
1,1-Dichloroethane	0.80	U H	1.0	0.80	0.22	ug/L		11/22/23 20:10	1
1,1-Dichloroethene	0.80	U H	1.0	0.80	0.23	ug/L		11/22/23 20:10	1
1,2-Dichlorobenzene	0.50	U H	1.0	0.50	0.37	ug/L		11/22/23 20:10	1
1,2-Dichloroethane	0.80	U H	1.0	0.80	0.54	ug/L		11/22/23 20:10	1
1,2-Dichloroethene, Total	0.40	U H	1.0	0.40	0.32	ug/L		11/22/23 20:10	1
1,2-Dichloropropane	0.80	U H	1.0	0.80	0.52	ug/L		11/22/23 20:10	1
1,3-Dichlorobenzene	0.40	U H	1.0	0.40	0.33	ug/L		11/22/23 20:10	1
1,4-Dichlorobenzene	0.50	U H	1.0	0.50	0.39	ug/L		11/22/23 20:10	1
2-Butanone (MEK)	12	U H	15	12	6.0	ug/L		11/22/23 20:10	1
2-Hexanone	4.0	U H	5.0	4.0	1.7	ug/L		11/22/23 20:10	1
4-Methyl-2-pentanone (MIBK)	3.2	U H	5.0	3.2	0.98	ug/L		11/22/23 20:10	1
Acetone	8.0	U H	15	8.0	6.6	ug/L		11/22/23 20:10	1
Benzene	0.80	U H	1.0	0.80	0.31	ug/L		11/22/23 20:10	1
Bromoform	1.8	U H	2.0	1.8	1.2	ug/L		11/22/23 20:10	1
Bromomethane	4.0	U H	5.0	4.0	2.4	ug/L		11/22/23 20:10	1
Carbon disulfide	0.80	U H	2.0	0.80	0.63	ug/L		11/22/23 20:10	1
Carbon tetrachloride	0.80	U H	1.0	0.80	0.57	ug/L		11/22/23 20:10	1
Chlorobenzene	0.80	U H	1.0	0.80	0.42	ug/L		11/22/23 20:10	1
Chlorodibromomethane	1.8	U H	2.0	1.8	0.62	ug/L		11/22/23 20:10	1
Chloroethane	1.6	U H	4.0	1.6	1.4	ug/L		11/22/23 20:10	1
Chloroform	0.80	U H	1.0	0.80	0.36	ug/L		11/22/23 20:10	1
Chloromethane	1.0	U H	2.0	1.0	0.75	ug/L		11/22/23 20:10	1
cis-1,2-Dichloroethene	0.40	U H	1.0	0.40	0.32	ug/L		11/22/23 20:10	1
cis-1,3-Dichloropropene	1.8	U H	2.0	1.8	0.63	ug/L		11/22/23 20:10	1
Dichlorobromomethane	0.50	U H	1.0	0.50	0.39	ug/L		11/22/23 20:10	1
Dichlorodifluoromethane	2.5	U H	3.0	2.5	0.96	ug/L		11/22/23 20:10	1
Ethylbenzene	0.40	U H	1.0	0.40	0.30	ug/L		11/22/23 20:10	1
Ethylene Dibromide	0.80	U H	1.0	0.80	0.40	ug/L		11/22/23 20:10	1
Methyl tert-butyl ether	0.80	U H	5.0	0.80	0.25	ug/L		11/22/23 20:10	1
Methylene Chloride	1.8	U H	2.0	1.8	0.94	ug/L		11/22/23 20:10	1
m-Xylene & p-Xylene	0.80	U H	2.0	0.80	0.36	ug/L		11/22/23 20:10	1
o-Xylene	0.40	U H	1.0	0.40	0.33	ug/L		11/22/23 20:10	1
Styrene	0.80	U H	1.0	0.80	0.36	ug/L		11/22/23 20:10	1
Tetrachloroethene	0.80	U H	1.0	0.80	0.40	ug/L		11/22/23 20:10	1
Toluene	0.40	U H	1.0	0.40	0.32	ug/L		11/22/23 20:10	1
trans-1,2-Dichloroethene	0.50	U H	1.0	0.50	0.37	ug/L		11/22/23 20:10	1
trans-1,3-Dichloropropene	1.8	U H	2.0	1.8	0.65	ug/L		11/22/23 20:10	1
Trichloroethene	0.40	U H	1.0	0.40	0.30	ug/L		11/22/23 20:10	1
Trichlorofluoromethane	0.80	U H	2.0	0.80	0.57	ug/L		11/22/23 20:10	1
Vinyl chloride	1.0	U H	2.0	1.0	0.51	ug/L		11/22/23 20:10	1
Xylenes, Total	0.80	U H	1.0	0.80	0.33	ug/L		11/22/23 20:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 122*		*11/22/23 20:10*	*1*
4-Bromofluorobenzene (Surr)	*93*		*79 - 119*		*11/22/23 20:10*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*11/22/23 20:10*	*1*

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1

Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chlordane (technical)	0.42	U	0.52	0.42	0.17	ug/L		11/16/23 18:50	1
delta-BHC	0.0042	U M	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Dieldrin	**0.0069**	**J**	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Endosulfan I	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Endosulfan II	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Endosulfan sulfate	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Endrin	0.0042	U	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
Endrin aldehyde	0.017	U	0.052	0.017	0.0042	ug/L		11/16/23 18:50	1
Endrin ketone	0.017	U	0.052	0.017	0.0042	ug/L		11/16/23 18:50	1
gamma-BHC (Lindane)	0.0042	U	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
Heptachlor	**0.0047**	**J**	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
Heptachlor epoxide	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
Methoxychlor	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
PCB-1016	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1221	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1232	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1242	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1248	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1254	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1260	0.25	U M Q	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
Toxaphene	0.84	U M	5.2	0.84	0.33	ug/L		11/16/23 18:50	1
4,4'-DDD	0.0042	U M	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
4,4'-DDE	0.0042	U	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
4,4'-DDT	0.0042	U	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
Aldrin	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1
alpha-BHC	**0.0083**	**J**	0.052	0.0042	0.0010	ug/L		11/16/23 18:50	1
beta-BHC	0.0042	U	0.052	0.0042	0.0021	ug/L		11/16/23 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*78*		*14 - 130*	*11/14/23 10:36*	*11/16/23 18:50*	*1*
Tetrachloro-m-xylene	*46*		*44 - 124*	*11/14/23 10:36*	*11/16/23 18:50*	*1*

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/15/23 15:11	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/15/23 15:11	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/15/23 15:11	1
Copper	**9.5**	**J**	20	10	3.2	ug/L		11/15/23 15:11	1
Lead	20	U	40	20	6.6	ug/L		11/15/23 15:11	1
Nickel	10	U	40	10	3.3	ug/L		11/15/23 15:11	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/15/23 15:11	1
Zinc	20	U	25	20	8.7	ug/L		11/15/23 15:11	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**4.4**	**J**	5.0	3.0	0.86	ug/L		11/15/23 16:04	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/20/23 14:02	1

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1
Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/17/23 10:05	1
pH (SW846 9040C)	**7.2**	**HF**		2.0		SU		11/15/23 11:02	1
Temperature (SW846 9040C)	**16.2**	**HF**		2.0		Degrees C		11/15/23 11:02	1

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Method: 624 - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-635040/9
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.39	ug/L		11/22/23 18:48	1
1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21	ug/L		11/22/23 18:48	1
1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27	ug/L		11/22/23 18:48	1
1,1-Dichloroethane	0.80	U	1.0	0.80	0.22	ug/L		11/22/23 18:48	1
1,1-Dichloroethene	0.80	U	1.0	0.80	0.23	ug/L		11/22/23 18:48	1
1,2-Dichlorobenzene	0.50	U	1.0	0.50	0.37	ug/L		11/22/23 18:48	1
1,2-Dichloroethane	0.80	U	1.0	0.80	0.54	ug/L		11/22/23 18:48	1
1,2-Dichloroethene, Total	0.40	U	1.0	0.40	0.32	ug/L		11/22/23 18:48	1
1,2-Dichloropropane	0.80	U	1.0	0.80	0.52	ug/L		11/22/23 18:48	1
1,3-Dichlorobenzene	0.40	U	1.0	0.40	0.33	ug/L		11/22/23 18:48	1
1,4-Dichlorobenzene	0.50	U	1.0	0.50	0.39	ug/L		11/22/23 18:48	1
2-Butanone (MEK)	12	U	15	12	6.0	ug/L		11/22/23 18:48	1
2-Hexanone	4.0	U	5.0	4.0	1.7	ug/L		11/22/23 18:48	1
4-Methyl-2-pentanone (MIBK)	3.2	U	5.0	3.2	0.98	ug/L		11/22/23 18:48	1
Acetone	8.0	U	15	8.0	6.6	ug/L		11/22/23 18:48	1
Benzene	0.80	U	1.0	0.80	0.31	ug/L		11/22/23 18:48	1
Bromoform	1.8	U	2.0	1.8	1.2	ug/L		11/22/23 18:48	1
Bromomethane	4.0	U	5.0	4.0	2.4	ug/L		11/22/23 18:48	1
Carbon disulfide	0.80	U	2.0	0.80	0.63	ug/L		11/22/23 18:48	1
Carbon tetrachloride	0.80	U	1.0	0.80	0.57	ug/L		11/22/23 18:48	1
Chlorobenzene	0.80	U	1.0	0.80	0.42	ug/L		11/22/23 18:48	1
Chlorodibromomethane	1.8	U	2.0	1.8	0.62	ug/L		11/22/23 18:48	1
Chloroethane	1.6	U	4.0	1.6	1.4	ug/L		11/22/23 18:48	1
Chloroform	0.80	U	1.0	0.80	0.36	ug/L		11/22/23 18:48	1
Chloromethane	1.0	U	2.0	1.0	0.75	ug/L		11/22/23 18:48	1
cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.32	ug/L		11/22/23 18:48	1
cis-1,3-Dichloropropene	1.8	U	2.0	1.8	0.63	ug/L		11/22/23 18:48	1
Dichlorobromomethane	0.50	U	1.0	0.50	0.39	ug/L		11/22/23 18:48	1
Dichlorodifluoromethane	2.5	U	3.0	2.5	0.96	ug/L		11/22/23 18:48	1
Ethylbenzene	0.40	U	1.0	0.40	0.30	ug/L		11/22/23 18:48	1
Ethylene Dibromide	0.80	U	1.0	0.80	0.40	ug/L		11/22/23 18:48	1
Methyl tert-butyl ether	0.80	U	5.0	0.80	0.25	ug/L		11/22/23 18:48	1
Methylene Chloride	1.8	U	2.0	1.8	0.94	ug/L		11/22/23 18:48	1
m-Xylene & p-Xylene	0.80	U	2.0	0.80	0.36	ug/L		11/22/23 18:48	1
o-Xylene	0.40	U	1.0	0.40	0.33	ug/L		11/22/23 18:48	1
Styrene	0.80	U	1.0	0.80	0.36	ug/L		11/22/23 18:48	1
Tetrachloroethene	0.80	U	1.0	0.80	0.40	ug/L		11/22/23 18:48	1
Toluene	0.40	U	1.0	0.40	0.32	ug/L		11/22/23 18:48	1
trans-1,2-Dichloroethene	0.50	U	1.0	0.50	0.37	ug/L		11/22/23 18:48	1
trans-1,3-Dichloropropene	1.8	U	2.0	1.8	0.65	ug/L		11/22/23 18:48	1
Trichloroethene	0.40	U	1.0	0.40	0.30	ug/L		11/22/23 18:48	1
Trichlorofluoromethane	0.80	U	2.0	0.80	0.57	ug/L		11/22/23 18:48	1
Vinyl chloride	1.0	U	2.0	1.0	0.51	ug/L		11/22/23 18:48	1
Xylenes, Total	0.80	U	1.0	0.80	0.33	ug/L		11/22/23 18:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*73 - 122*		*11/22/23 18:48*	*1*
4-Bromofluorobenzene (Surr)	*93*		*79 - 119*		*11/22/23 18:48*	*1*

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-635040/9
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		80 - 120		11/22/23 18:48	1

Lab Sample ID: LCS 280-635040/4
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	50.0	50.4		ug/L		101	70 - 130
1,1,2,2-Tetrachloroethane	50.0	44.3		ug/L		89	60 - 140
1,1,2-Trichloroethane	50.0	48.2		ug/L		96	70 - 130
1,1-Dichloroethane	50.0	45.1		ug/L		90	70 - 130
1,1-Dichloroethene	50.0	49.6		ug/L		99	50 - 150
1,2-Dichlorobenzene	50.0	48.0		ug/L		96	65 - 135
1,2-Dichloroethane	50.0	45.5		ug/L		91	70 - 130
1,2-Dichloroethene, Total	100	92.0		ug/L		92	75 - 130
1,2-Dichloropropane	50.0	45.2		ug/L		90	35 - 165
1,3-Dichlorobenzene	50.0	46.8		ug/L		94	70 - 130
1,4-Dichlorobenzene	50.0	46.2		ug/L		92	65 - 135
2-Butanone (MEK)	200	184		ug/L		92	49 - 153
2-Hexanone	200	192		ug/L		96	50 - 154
4-Methyl-2-pentanone (MIBK)	200	190		ug/L		95	48 - 157
Acetone	200	171		ug/L		85	44 - 168
Benzene	50.0	46.2		ug/L		92	65 - 135
Bromoform	50.0	46.6		ug/L		93	70 - 130
Bromomethane	50.0	55.1		ug/L		110	15 - 185
Carbon disulfide	50.0	44.5		ug/L		89	61 - 138
Carbon tetrachloride	50.0	51.6		ug/L		103	70 - 130
Chlorobenzene	50.0	47.5		ug/L		95	65 - 135
Chlorodibromomethane	50.0	48.5		ug/L		97	70 - 135
Chloroethane	50.0	42.6		ug/L		85	40 - 160
Chloroform	50.0	46.7		ug/L		93	70 - 135
Chloromethane	50.0	53.6		ug/L		107	10 - 205
cis-1,2-Dichloroethene	50.0	46.6		ug/L		93	76 - 128
cis-1,3-Dichloropropene	50.0	46.5		ug/L		93	25 - 175
Dichlorobromomethane	50.0	46.7		ug/L		93	65 - 135
Dichlorodifluoromethane	50.0	41.9		ug/L		84	32 - 152
Ethylbenzene	50.0	48.5		ug/L		97	60 - 140
Ethylene Dibromide	50.0	47.7		ug/L		95	77 - 126
Methyl tert-butyl ether	50.0	45.8		ug/L		92	74 - 128
Methylene Chloride	50.0	43.9		ug/L		88	60 - 140
m-Xylene & p-Xylene	50.0	48.5		ug/L		97	78 - 128
o-Xylene	50.0	47.3		ug/L		95	80 - 127
Styrene	50.0	48.2		ug/L		96	76 - 130
Tetrachloroethene	50.0	52.7		ug/L		105	70 - 130
Toluene	50.0	46.3		ug/L		93	70 - 130
trans-1,2-Dichloroethene	50.0	45.4		ug/L		91	70 - 130
trans-1,3-Dichloropropene	50.0	44.9		ug/L		90	50 - 150
Trichloroethene	50.0	46.5		ug/L		93	65 - 135

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-635040/4
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichlorofluoromethane	50.0	50.4		ug/L		101	50 - 150
Vinyl chloride	50.0	58.6		ug/L		117	10 - 195
Xylenes, Total	100	95.8		ug/L		96	80 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 122*
4-Bromofluorobenzene (Surr)	*91*		*79 - 119*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 280-635040/6
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane	50.0	50.3		ug/L		101	70 - 130	0	30
1,1,2,2-Tetrachloroethane	50.0	46.0		ug/L		92	60 - 140	4	30
1,1,2-Trichloroethane	50.0	51.7		ug/L		103	70 - 130	7	30
1,1-Dichloroethane	50.0	46.3		ug/L		93	70 - 130	3	30
1,1-Dichloroethene	50.0	50.7		ug/L		101	50 - 150	2	30
1,2-Dichlorobenzene	50.0	47.6		ug/L		95	65 - 135	1	30
1,2-Dichloroethane	50.0	46.6		ug/L		93	70 - 130	2	30
1,2-Dichloroethene, Total	100	94.3		ug/L		94	75 - 130	2	30
1,2-Dichloropropane	50.0	47.2		ug/L		94	35 - 165	4	30
1,3-Dichlorobenzene	50.0	47.6		ug/L		95	70 - 130	2	30
1,4-Dichlorobenzene	50.0	45.8		ug/L		92	65 - 135	1	30
2-Butanone (MEK)	200	200		ug/L		100	49 - 153	8	32
2-Hexanone	200	200		ug/L		100	50 - 154	5	30
4-Methyl-2-pentanone (MIBK)	200	202		ug/L		101	48 - 157	6	30
Acetone	200	188		ug/L		94	44 - 168	10	30
Benzene	50.0	47.3		ug/L		95	65 - 135	2	30
Bromoform	50.0	48.9		ug/L		98	70 - 130	5	30
Bromomethane	50.0	61.7		ug/L		123	15 - 185	11	30
Carbon disulfide	50.0	45.8		ug/L		92	61 - 138	3	30
Carbon tetrachloride	50.0	51.8		ug/L		104	70 - 130	0	30
Chlorobenzene	50.0	48.5		ug/L		97	65 - 135	2	30
Chlorodibromomethane	50.0	50.3		ug/L		101	70 - 135	3	30
Chloroethane	50.0	46.3		ug/L		93	40 - 160	8	30
Chloroform	50.0	48.7		ug/L		97	70 - 135	4	30
Chloromethane	50.0	57.7		ug/L		115	10 - 205	7	30
cis-1,2-Dichloroethene	50.0	48.2		ug/L		96	76 - 128	4	30
cis-1,3-Dichloropropene	50.0	47.7		ug/L		95	25 - 175	3	30
Dichlorobromomethane	50.0	49.4		ug/L		99	65 - 135	6	30
Dichlorodifluoromethane	50.0	50.6		ug/L		101	32 - 152	19	30
Ethylbenzene	50.0	48.8		ug/L		98	60 - 140	1	30
Ethylene Dibromide	50.0	49.1		ug/L		98	77 - 126	3	30
Methyl tert-butyl ether	50.0	46.8		ug/L		94	74 - 128	2	30
Methylene Chloride	50.0	45.6		ug/L		91	60 - 140	4	30
m-Xylene & p-Xylene	50.0	49.3		ug/L		99	78 - 128	2	30

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-635040/6
Matrix: Water
Analysis Batch: 635040

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
o-Xylene			50.0	49.4		ug/L		99	80 - 127	5	30
Styrene			50.0	49.8		ug/L		100	76 - 130	3	30
Tetrachloroethene			50.0	52.6		ug/L		105	70 - 130	0	30
Toluene			50.0	48.5		ug/L		97	70 - 130	5	30
trans-1,2-Dichloroethene			50.0	46.1		ug/L		92	70 - 130	2	30
trans-1,3-Dichloropropene			50.0	48.9		ug/L		98	50 - 150	9	30
Trichloroethene			50.0	46.4		ug/L		93	65 - 135	0	30
Trichlorofluoromethane			50.0	52.4		ug/L		105	50 - 150	4	30
Vinyl chloride			50.0	61.3		ug/L		123	10 - 195	5	30
Xylenes, Total			100	98.7		ug/L		99	80 - 127	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 122*
4-Bromofluorobenzene (Surr)	*92*		*79 - 119*
Toluene-d8 (Surr)	*99*		*80 - 120*

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-808087/1-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808087

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chlordane (technical)	0.40	U	0.50	0.40	0.16	ug/L		11/16/23 13:17	1
delta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Dieldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan I	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan II	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan sulfate	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endrin	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Endrin aldehyde	0.016	U M	0.050	0.016	0.0040	ug/L		11/16/23 13:17	1
Endrin ketone	0.016	U	0.050	0.016	0.0040	ug/L		11/16/23 13:17	1
gamma-BHC (Lindane)	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Heptachlor	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Heptachlor epoxide	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Methoxychlor	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
PCB-1016	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1221	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1232	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1242	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1248	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1254	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1260	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
Toxaphene	0.80	U M	5.0	0.80	0.31	ug/L		11/16/23 13:17	1
4,4'-DDD	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
4,4'-DDE	0.0040	U M	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
4,4'-DDT	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Aldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
alpha-BHC	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: MB 680-808087/1-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808087

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
beta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*42*		*14 - 130*	*11/14/23 10:36*	*11/16/23 13:17*	*1*
Tetrachloro-m-xylene	*46*	*M*	*44 - 124*	*11/14/23 10:36*	*11/16/23 13:17*	*1*

Lab Sample ID: LCS 680-808087/2-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808087

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
delta-BHC	0.0400	0.0304	J	ug/L		76	52 - 142
Dieldrin	0.0400	0.0298	J	ug/L		74	60 - 136
Endosulfan I	0.0400	0.0256	J	ug/L		64	62 - 126
Endosulfan II	0.0400	0.0229	J	ug/L		57	52 - 135
Endosulfan sulfate	0.0400	0.0304	J	ug/L		76	62 - 133
Endrin	0.0400	0.0260	J	ug/L		65	60 - 138
Endrin aldehyde	0.0400	0.0254	J	ug/L		63	51 - 132
Endrin ketone	0.0400	0.0515		ug/L		129	58 - 134
gamma-BHC (Lindane)	0.0400	0.0275	J	ug/L		69	59 - 134
Heptachlor	0.0400	0.0411	J	ug/L		103	54 - 130
Heptachlor epoxide	0.0400	0.0268	J	ug/L		67	61 - 133
Methoxychlor	0.0400	0.0425	J M	ug/L		106	54 - 145
4,4'-DDD	0.0400	0.0288	J M	ug/L		72	56 - 143
4,4'-DDE	0.0400	0.0244	J M	ug/L		61	57 - 135
4,4'-DDT	0.0400	0.0221	J M	ug/L		55	51 - 143
Aldrin	0.0400	0.0182	J	ug/L		45	45 - 134
alpha-BHC	0.0400	0.0272	J	ug/L		68	54 - 138
beta-BHC	0.0400	0.0332	J	ug/L		83	56 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*52*		*14 - 130*
Tetrachloro-m-xylene	*49*		*44 - 124*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-808275/1-A
Matrix: Water
Analysis Batch: 808561

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808275

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/15/23 14:52	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/15/23 14:52	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/15/23 14:52	1
Copper	10	U	20	10	3.2	ug/L		11/15/23 14:52	1
Lead	20	U	40	20	6.6	ug/L		11/15/23 14:52	1
Nickel	10	U	40	10	3.3	ug/L		11/15/23 14:52	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/15/23 14:52	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-808275/1-A
Matrix: Water
Analysis Batch: 808561

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808275

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Zinc	20	U	25	20	8.7	ug/L		11/15/23 14:52	1

Lab Sample ID: LCS 680-808275/2-A
Matrix: Water
Analysis Batch: 808561

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808275

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	5050	5210		ug/L		103	86 - 115
Cadmium	50.0	53.6		ug/L		107	88 - 113
Chromium	100	106		ug/L		106	90 - 113
Copper	101	109		ug/L		108	86 - 114
Lead	500	513		ug/L		103	86 - 113
Nickel	100	103		ug/L		103	88 - 113
Silver	50.0	51.3		ug/L		103	84 - 115
Zinc	50.5	53.4		ug/L		106	87 - 115

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-808276/1-A
Matrix: Water
Analysis Batch: 808566

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 808276

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/15/23 15:27	1

Lab Sample ID: LCS 680-808276/2-A
Matrix: Water
Analysis Batch: 808566

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 808276

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	115		ug/L		115	84 - 116

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-809186/12-A
Matrix: Water
Analysis Batch: 809395

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 809186

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/20/23 13:48	1

Lab Sample ID: LCS 680-809186/13-A
Matrix: Water
Analysis Batch: 809395

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 809186

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.51		ug/L		100	80 - 124

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-808769/12-A
Matrix: Water
Analysis Batch: 808843

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808769

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		11/17/23 10:12	1

Lab Sample ID: LCS 680-808769/13-A
Matrix: Water
Analysis Batch: 808843

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0522		mg/L		104	83 - 116

Method: 9040C - pH

Lab Sample ID: LCS 680-808370/1
Matrix: Water
Analysis Batch: 808370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.01	7.1		SU		101	63 - 158

GC/MS VOA

Analysis Batch: 635040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	624	
MB 280-635040/9	Method Blank	Total/NA	Water	624	
LCS 280-635040/4	Lab Control Sample	Total/NA	Water	624	
LCSD 280-635040/6	Lab Control Sample Dup	Total/NA	Water	624	

GC Semi VOA

Prep Batch: 808087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	3510C	
MB 680-808087/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-808087/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 808572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	8081B 8082A	808087
MB 680-808087/1-A	Method Blank	Total/NA	Water	8081B 8082A	808087
LCS 680-808087/2-A	Lab Control Sample	Total/NA	Water	8081B 8082A	808087

Metals

Prep Batch: 808275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total Recoverable	Water	3005A	
MB 680-808275/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808275/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 808276

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total Recoverable	Water	3005A	
MB 680-808276/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-808276/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 808561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total Recoverable	Water	6010C	808275
MB 680-808275/1-A	Method Blank	Total Recoverable	Water	6010C	808275
LCS 680-808275/2-A	Lab Control Sample	Total Recoverable	Water	6010C	808275

Analysis Batch: 808566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total Recoverable	Water	6020A	808276
MB 680-808276/1-A	Method Blank	Total Recoverable	Water	6020A	808276
LCS 680-808276/2-A	Lab Control Sample	Total Recoverable	Water	6020A	808276

Prep Batch: 809186

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	7470A	
MB 680-809186/12-A	Method Blank	Total/NA	Water	7470A	
LCS 680-809186/13-A	Lab Control Sample	Total/NA	Water	7470A	

QC Association Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Metals

Analysis Batch: 809395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	7470A	809186
MB 680-809186/12-A	Method Blank	Total/NA	Water	7470A	809186
LCS 680-809186/13-A	Lab Control Sample	Total/NA	Water	7470A	809186

General Chemistry

Analysis Batch: 808370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	9040C	
LCS 680-808370/1	Lab Control Sample	Total/NA	Water	9040C	

Prep Batch: 808769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	9012B	
MB 680-808769/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-808769/13-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 808843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	9012B	808769
MB 680-808769/12-A	Method Blank	Total/NA	Water	9012B	808769
LCS 680-808769/13-A	Lab Control Sample	Total/NA	Water	9012B	808769

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1

Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	5 mL	5 mL	635040	11/22/23 20:10	ETB	EET DEN
	Instrument ID: VMS_R1									
Total/NA	Prep	3510C			238.4 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 18:50	UI	EET SAV
	Instrument ID: CSGAA									
Total Recoverable	Prep	3005A			25 mL	25 mL	808275	11/15/23 06:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			808561	11/15/23 15:11	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	808276	11/15/23 06:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808566	11/15/23 16:04	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	809186	11/20/23 08:40	DW	EET SAV
Total/NA	Analysis	7470A		1			809395	11/20/23 14:02	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Prep	9012B			6 mL	6 mL	808769	11/17/23 06:36	JAS	EET SAV
Total/NA	Analysis	9012B		1			808843	11/17/23 10:05	JAS	EET SAV
	Instrument ID: KONELAB4									
Total/NA	Analysis	9040C		1			808370	11/15/23 11:02	PG	EET SAV
	Instrument ID: MANTECH 2									

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-1
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Method	Method Description	Protocol	Laboratory
624	Volatile Organic Compounds (GC/MS)	EPA	EET DEN
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
7470A	Mercury (CVAA)	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable	EPA	EET SAV
9040C	pH	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
7470A	Preparation, Mercury	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET SAV

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # DCL-LEACH-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023
Project Number: DEVNS-LTM PO 2312 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
M8015D (A) = Diesel Range
SW7470A (A) = Mercury
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide
SW9065 (A) = Phenolics

Equipment:

Code	Matrix
WL	Leachate

Code	Container/Preservative
1	2x 1L amber glass bottles, Cool to <6degC
2	2x 1L amber glass bottles, Cool to <6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
11	1x 500mL, amber glass, H2SO4; Cool < 6degC
21	1x 2-1 Liter, amber, glass, Cool < 6degC
29	3x 40mL glass VOA Vials, Cool < 6degC; adjust pH <2
33	2x 1 liter, amber, glass, Cool < 6degC
45	1x 500mL plastic, Cool < 6degC
48	1x 250mL plastic, NaOH to pH >12; Cool < 6degC

Analytical Test Method

	A2540D - TSS	E624 - VOCs	E625 - SVOCs	M8015D (A)	SW6010C - Fe Mn	SW6020A - As	SW7470A (A)	SW8081B (A)	SW8082A - PCB	SW9012B (A)	SW9040C - pH	SW9065 (A)
Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023	45	29	33	21	9	9	9	21	1	48	2	11

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	DCL LEACHATE-FAL23	WL	11/7/23	1040	MS	DCL LEACHATE	N1	0.00	0.00	1	
2											
3											
4											
5											
6											

Turnaround Time: NA

680-242837 Chain of Custody

Relinquished by: (Signature)
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) TS
Date 11-10-23
Time 1006

2.2/2.5

11/30/2023

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756852.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242837-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 11/27/2023			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM DCL Leach, Fall 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	624_5ml_DOD5/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DCL LEACHATE-FAL23 (680-242837-1)	11/7/23	10:40 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: TH	Date/Time: 11-21-23	Company	Received by:	Date/Time: 11/22/23 1020	Company: EET PEN
Relinquished by:	Date/Time: 1620	Company	Received by	Date/Time:	Company
Relinquished by:	Date/Time	Company	Received by	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.5 2.0 0+.3 W none

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242837-1

Login Number: 242837

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242837-1

Login Number: 242837
List Number: 2
Creator: Little, Matthew L

List Source: Eurofins Denver
List Creation: 11/22/23 01:39 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 12/26/2023 1:58:26 AM

JOB DESCRIPTION

Seres-Arcadis JV, LTM DCL Leach, Fall 2023

JOB NUMBER

680-242837-2

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

Generated
12/26/2023 1:58:26 AM

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242837-1	DCL LEACHATE-FAL23	Water	11/07/23 10:40	11/10/23 10:06

Job ID: 680-242837-2 Eurofins Savannah

Job Narrative
680-242837-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 11/10/2023 10:06 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.5°C

Receipt Exceptions
<EXPLANATION_REQUIRED>

DCL LEACHATE-FAL23 (680-242837-1)

COC does not match what labels on bottles have marked for analysis. Containers received are marked identically to login 680-242830.

Unknown which analysis are really intended.

Pesticides/PCBs
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1
Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1221	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1232	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1242	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1248	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1254	0.25	U	0.52	0.25	0.10	ug/L		11/16/23 18:50	1
PCB-1260	0.25	U M	0.52	0.25	0.10	ug/L		11/16/23 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*78*		*14 - 130*	*11/14/23 10:36*	*11/16/23 18:50*	*1*
Tetrachloro-m-xylene	*46*		*44 - 124*	*11/14/23 10:36*	*11/16/23 18:50*	*1*

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-808087/1-A
Matrix: Water
Analysis Batch: 808569

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808087

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1221	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1232	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1242	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1248	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1254	0.24	U M	0.50	0.24	0.10	ug/L		11/16/23 13:17	1
PCB-1260	0.24	U	0.50	0.24	0.10	ug/L		11/16/23 13:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*38*		*14 - 130*	*11/14/23 10:36*	*11/16/23 13:17*	*1*
Tetrachloro-m-xylene	*46*	*M*	*44 - 124*	*11/14/23 10:36*	*11/16/23 13:17*	*1*

Lab Sample ID: LCS 680-808087/12-A
Matrix: Water
Analysis Batch: 808569

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808087

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016			2.00	1.31	M	ug/L		66	46 - 129		
PCB-1260			2.00	1.71		ug/L		85	45 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*59*		*14 - 130*
Tetrachloro-m-xylene	*57*		*44 - 124*

Lab Sample ID: LCSD 680-808087/13-A
Matrix: Water
Analysis Batch: 808569

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 808087

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016			2.00	1.18	M	ug/L		59	46 - 129	11	30
PCB-1260			2.00	1.84	M	ug/L		92	45 - 134	8	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*75*		*14 - 130*
Tetrachloro-m-xylene	*55*		*44 - 124*

QC Association Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

GC Semi VOA

Prep Batch: 808087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	3510C	
MB 680-808087/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-808087/12-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 680-808087/13-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 808569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242837-1	DCL LEACHATE-FAL23	Total/NA	Water	8081B 8082A	808087
MB 680-808087/1-A	Method Blank	Total/NA	Water	8081B 8082A	808087
LCS 680-808087/12-A	Lab Control Sample	Total/NA	Water	8081B 8082A	808087
LCSD 680-808087/13-A	Lab Control Sample Dup	Total/NA	Water	8081B 8082A	808087

Lab Chronicle

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Client Sample ID: DCL LEACHATE-FAL23
Lab Sample ID: 680-242837-1
Date Collected: 11/07/23 10:40
Matrix: Water
Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			238.4 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808569	11/16/23 18:50	DBM	EET SAV
	Instrument ID: CSGAA									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Method Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242837-2
Project/Site: Seres-Arcadis JV, LTM DCL Leach, Fall 2023

Method	Method Description	Protocol	Laboratory
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242837-2

Login Number: 242837

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

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JOB DESCRIPTION

Fort Devens, Long Term Monitoring

JOB NUMBER

680-243143-1

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

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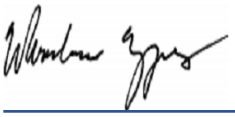

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Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-243143-1	DCL Leachate-Fal23	Water	11/14/23 09:30	11/15/23 10:07

Job ID: 680-243143-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative
680-243143-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 11/15/2023 10:07 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.1°C

GC/MS Semi VOA
Method 625_DOD: Sample DCL Leachate Fal23 (680-243143-1) was received in Denver for analysis outside of holding time.

Method 625_DOD: Surrogate Phenol-d5 recovery in the method blank, lab control sample, lab control sample duplicate, and the associated samples was below control limits. The associated sample is outside of 2x hold time and has already been re-extracted; data has been qualified and reported. DCL Leachate Fal23 (680-243143-1), (LCS 280-635134/2-A), (LCSD 280-635134/3-A) and (MB 280-635134/1-A)

Method 625_DOD: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 280-635134 and analytical batch 280-635417 recovered outside control limits for the following analytes: Benzidine.

Method 625_DOD: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 280-635134 and analytical batch 280-635417 recovered outside control limits for the following analytes: 2-Chloronaphthalene, Benzidine, Hexachlorocyclopentadiene, N-Nitrosodiphenylamine and Pyrene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method 8015C_DRO_DOD5: Surrogate recovery for the following sample was marginally outside acceptance limits: DCL Leachate Fal23 (680-243143-1). The results have been reported due to expired holding time.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 2540D: The sample duplicate precision for the following sample associated with analytical batch 680-809273 was outside control limits: (680-243143-E-1 DU). The associated Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) precision met acceptance criteria.

Method 9065: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for prep batch 809469 and analytical batch 809577 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Client Sample ID: DCL Leachate-Fal23
Date Collected: 11/14/23 09:30
Date Received: 11/15/23 10:07

Lab Sample ID: 680-243143-1
Matrix: Water

Method: EPA 625 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	3.1	U H	3.8	3.1	1.2	ug/L		11/29/23 11:25	1
1,2-Dichlorobenzene	3.1	U H	3.8	3.1	0.22	ug/L		11/29/23 11:25	1
1,3-Dichlorobenzene	7.6	U H	9.5	7.6	0.29	ug/L		11/29/23 11:25	1
1,4-Dichlorobenzene	3.1	U H	3.8	3.1	1.2	ug/L		11/29/23 11:25	1
2,2'-oxybis[1-chloropropane]	7.6	U H	9.5	7.6	0.27	ug/L		11/29/23 11:25	1
2,4,6-Trichlorophenol	7.6	U H	9.5	7.6	0.54	ug/L		11/29/23 11:25	1
2,4-Dichlorophenol	7.6	U H	9.5	7.6	0.61	ug/L		11/29/23 11:25	1
2,4-Dimethylphenol	7.6	U H	9.5	7.6	0.55	ug/L		11/29/23 11:25	1
2-Chloronaphthalene	3.1	U H Q	3.8	3.1	0.51	ug/L		11/29/23 11:25	1
2-Chlorophenol	7.6	U H	9.5	7.6	0.93	ug/L		11/29/23 11:25	1
2-Nitrophenol	7.6	U H	9.5	7.6	1.3	ug/L		11/29/23 11:25	1
3,3'-Dichlorobenzidine	29	U H	48	29	3.0	ug/L		11/29/23 11:25	1
4,6-Dinitro-2-methylphenol	29	U H	48	29	8.7	ug/L		11/29/23 11:25	1
4-Bromophenyl phenyl ether	7.6	U H	9.5	7.6	0.41	ug/L		11/29/23 11:25	1
4-Chloro-3-methylphenol	7.6	U H	9.5	7.6	2.3	ug/L		11/29/23 11:25	1
4-Chlorophenyl phenyl ether	7.6	U H	9.5	7.6	1.6	ug/L		11/29/23 11:25	1
4-Nitrophenol	8.4	U H	9.5	8.4	3.0	ug/L		11/29/23 11:25	1
Acenaphthene	3.1	U H	3.8	3.1	0.60	ug/L		11/29/23 11:25	1
Acenaphthylene	3.1	U H	3.8	3.1	0.47	ug/L		11/29/23 11:25	1
Anthracene	3.1	U H	3.8	3.1	0.40	ug/L		11/29/23 11:25	1
Benzidine	95	U H Q	95	95	48	ug/L		11/29/23 11:25	1
Benzo[a]anthracene	3.1	U H	3.8	3.1	0.86	ug/L		11/29/23 11:25	1
Benzo[a]pyrene	3.1	U H	3.8	3.1	0.70	ug/L		11/29/23 11:25	1
Benzo[b]fluoranthene	3.1	U H	3.8	3.1	1.2	ug/L		11/29/23 11:25	1
Benzo[g,h,i]perylene	3.1	U H	3.8	3.1	0.48	ug/L		11/29/23 11:25	1
Benzo[k]fluoranthene	3.1	U H	3.8	3.1	0.44	ug/L		11/29/23 11:25	1
Bis(2-chloroethoxy)methane	7.6	U H	9.5	7.6	0.93	ug/L		11/29/23 11:25	1
Bis(2-chloroethyl)ether	7.6	U H	9.5	7.6	0.79	ug/L		11/29/23 11:25	1
Bis(2-ethylhexyl) phthalate	7.6	U H	9.5	7.6	2.3	ug/L		11/29/23 11:25	1
Butyl benzyl phthalate	3.1	U H	3.8	3.1	0.95	ug/L		11/29/23 11:25	1
Chrysene	3.1	U H	3.8	3.1	0.52	ug/L		11/29/23 11:25	1
Dibenz(a,h)anthracene	7.6	U H	9.5	7.6	2.1	ug/L		11/29/23 11:25	1
Diethyl phthalate	0.95	U H	3.8	0.95	0.36	ug/L		11/29/23 11:25	1
Dimethyl phthalate	3.1	U M H	3.8	3.1	0.20	ug/L		11/29/23 11:25	1
Di-n-butyl phthalate	3.1	U H	3.8	3.1	1.1	ug/L		11/29/23 11:25	1
Di-n-octyl phthalate	7.6	U H	9.5	7.6	3.8	ug/L		11/29/23 11:25	1
Fluoranthene	3.1	U H	3.8	3.1	0.86	ug/L		11/29/23 11:25	1
Fluorene	3.1	U H	3.8	3.1	0.30	ug/L		11/29/23 11:25	1
Hexachlorobenzene	7.6	U H	9.5	7.6	0.63	ug/L		11/29/23 11:25	1
Hexachlorobutadiene	7.6	U H	9.5	7.6	3.2	ug/L		11/29/23 11:25	1
Hexachlorocyclopentadiene	29	U H Q	48	29	3.0	ug/L		11/29/23 11:25	1
Hexachloroethane	7.6	U H	9.5	7.6	0.94	ug/L		11/29/23 11:25	1
Indeno[1,2,3-cd]pyrene	7.6	U H	9.5	7.6	2.9	ug/L		11/29/23 11:25	1
Isophorone	7.6	U H	9.5	7.6	0.20	ug/L		11/29/23 11:25	1
Naphthalene	1.9	U H	3.8	1.9	0.28	ug/L		11/29/23 11:25	1
Nitrobenzene	7.6	U H	9.5	7.6	0.77	ug/L		11/29/23 11:25	1
N-Nitrosodi-n-propylamine	7.6	U H	9.5	7.6	0.33	ug/L		11/29/23 11:25	1
N-Nitrosodiphenylamine	7.6	U H Q	9.5	7.6	0.42	ug/L		11/29/23 11:25	1
Pentachlorophenol	38	U H	48	38	19	ug/L		11/29/23 11:25	1

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Client Sample ID: DCL Leachate-Fal23

Date Collected: 11/14/23 09:30
Date Received: 11/15/23 10:07

Lab Sample ID: 680-243143-1

Matrix: Water

Method: EPA 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Phenanthrene	3.1	U H	3.8	3.1	0.66	ug/L		11/29/23 11:25	1
Phenol	7.6	U H	9.5	7.6	1.9	ug/L		11/29/23 11:25	1
Pyrene	7.6	U H Q	9.5	7.6	0.35	ug/L		11/29/23 11:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*88*		*50 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*
2-Fluorobiphenyl	*87*		*36 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*
2-Fluorophenol	*32*		*30 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*
Nitrobenzene-d5	*78*		*45 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*
Phenol-d5	*21*	*Q*	*36 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*
Terphenyl-d14	*109*		*52 - 120*	*11/27/23 11:53*	*11/29/23 11:25*	*1*

Method: SW846 8015C DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C10-C28	**0.22**	**J**	0.30	0.15	0.069	mg/L		11/21/23 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*51*	*M Q*	*56 - 125*	*11/20/23 07:59*	*11/21/23 20:43*	*1*

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Suspended Solids (SM 2540 D-2011)	**8.3**		8.3	8.3	8.3	mg/L		11/20/23 12:29	1
Phenolics, Total Recoverable (SW846 9065)	0.050	U J1	0.050	0.050	0.025	mg/L		11/21/23 19:48	1

Method: 625 - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-635134/1-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 635134

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	3.2	U	4.0	3.2	1.3	ug/L		11/29/23 09:12	1
1,2-Dichlorobenzene	3.2	U	4.0	3.2	0.23	ug/L		11/29/23 09:12	1
1,3-Dichlorobenzene	8.0	U	10	8.0	0.30	ug/L		11/29/23 09:12	1
1,4-Dichlorobenzene	3.2	U	4.0	3.2	1.3	ug/L		11/29/23 09:12	1
2,2'-oxybis[1-chloropropane]	8.0	U	10	8.0	0.28	ug/L		11/29/23 09:12	1
2,4,6-Trichlorophenol	8.0	U	10	8.0	0.56	ug/L		11/29/23 09:12	1
2,4-Dichlorophenol	8.0	U	10	8.0	0.64	ug/L		11/29/23 09:12	1
2,4-Dimethylphenol	8.0	U	10	8.0	0.58	ug/L		11/29/23 09:12	1
2-Chloronaphthalene	3.2	U	4.0	3.2	0.53	ug/L		11/29/23 09:12	1
2-Chlorophenol	8.0	U	10	8.0	0.97	ug/L		11/29/23 09:12	1
2-Nitrophenol	8.0	U	10	8.0	1.4	ug/L		11/29/23 09:12	1
3,3'-Dichlorobenzidine	30	U	50	30	3.1	ug/L		11/29/23 09:12	1
4,6-Dinitro-2-methylphenol	30	U	50	30	9.1	ug/L		11/29/23 09:12	1
4-Bromophenyl phenyl ether	8.0	U	10	8.0	0.43	ug/L		11/29/23 09:12	1
4-Chloro-3-methylphenol	8.0	U	10	8.0	2.4	ug/L		11/29/23 09:12	1
4-Chlorophenyl phenyl ether	8.0	U	10	8.0	1.7	ug/L		11/29/23 09:12	1
4-Nitrophenol	8.8	U	10	8.8	3.2	ug/L		11/29/23 09:12	1
Acenaphthene	3.2	U	4.0	3.2	0.63	ug/L		11/29/23 09:12	1
Acenaphthylene	3.2	U	4.0	3.2	0.49	ug/L		11/29/23 09:12	1
Anthracene	3.2	U	4.0	3.2	0.42	ug/L		11/29/23 09:12	1
Benzidine	100	U	100	100	50	ug/L		11/29/23 09:12	1
Benzo[a]anthracene	3.2	U	4.0	3.2	0.90	ug/L		11/29/23 09:12	1
Benzo[a]pyrene	3.2	U	4.0	3.2	0.73	ug/L		11/29/23 09:12	1
Benzo[b]fluoranthene	3.2	U	4.0	3.2	1.3	ug/L		11/29/23 09:12	1
Benzo[g,h,i]perylene	3.2	U	4.0	3.2	0.50	ug/L		11/29/23 09:12	1
Benzo[k]fluoranthene	3.2	U	4.0	3.2	0.46	ug/L		11/29/23 09:12	1
Bis(2-chloroethoxy)methane	8.0	U	10	8.0	0.97	ug/L		11/29/23 09:12	1
Bis(2-chloroethyl)ether	8.0	U	10	8.0	0.83	ug/L		11/29/23 09:12	1
Bis(2-ethylhexyl) phthalate	8.0	U	10	8.0	2.4	ug/L		11/29/23 09:12	1
Butyl benzyl phthalate	3.2	U	4.0	3.2	1.0	ug/L		11/29/23 09:12	1
Chrysene	3.2	U	4.0	3.2	0.54	ug/L		11/29/23 09:12	1
Dibenz(a,h)anthracene	8.0	U	10	8.0	2.2	ug/L		11/29/23 09:12	1
Diethyl phthalate	1.0	U	4.0	1.0	0.38	ug/L		11/29/23 09:12	1
Dimethyl phthalate	3.2	U	4.0	3.2	0.21	ug/L		11/29/23 09:12	1
Di-n-butyl phthalate	3.2	U	4.0	3.2	1.2	ug/L		11/29/23 09:12	1
Di-n-octyl phthalate	8.0	U	10	8.0	4.0	ug/L		11/29/23 09:12	1
Fluoranthene	3.2	U	4.0	3.2	0.90	ug/L		11/29/23 09:12	1
Fluorene	3.2	U	4.0	3.2	0.31	ug/L		11/29/23 09:12	1
Hexachlorobenzene	8.0	U	10	8.0	0.66	ug/L		11/29/23 09:12	1
Hexachlorobutadiene	8.0	U	10	8.0	3.3	ug/L		11/29/23 09:12	1
Hexachlorocyclopentadiene	30	U	50	30	3.1	ug/L		11/29/23 09:12	1
Hexachloroethane	8.0	U	10	8.0	0.98	ug/L		11/29/23 09:12	1
Indeno[1,2,3-cd]pyrene	8.0	U	10	8.0	3.1	ug/L		11/29/23 09:12	1
Isophorone	8.0	U	10	8.0	0.21	ug/L		11/29/23 09:12	1
Naphthalene	2.0	U	4.0	2.0	0.29	ug/L		11/29/23 09:12	1
Nitrobenzene	8.0	U	10	8.0	0.81	ug/L		11/29/23 09:12	1
N-Nitrosodi-n-propylamine	8.0	U	10	8.0	0.35	ug/L		11/29/23 09:12	1
N-Nitrosodiphenylamine	8.0	U M	10	8.0	0.44	ug/L		11/29/23 09:12	1

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-635134/1-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 635134

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Pentachlorophenol	40	U	50	40	20	ug/L		11/29/23 09:12	1
Phenanthrene	3.2	U	4.0	3.2	0.69	ug/L		11/29/23 09:12	1
Phenol	8.0	U	10	8.0	2.0	ug/L		11/29/23 09:12	1
Pyrene	8.0	U	10	8.0	0.37	ug/L		11/29/23 09:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*81*		*50 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*
2-Fluorobiphenyl	*91*		*36 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*
2-Fluorophenol	*43*		*30 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*
Nitrobenzene-d5	*91*		*45 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*
Phenol-d5	*26*	*Q*	*36 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*
Terphenyl-d14	*101*		*52 - 120*	*11/27/23 11:53*	*11/29/23 09:12*	*1*

Lab Sample ID: LCS 280-635134/2-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 635134

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2,4-Trichlorobenzene	80.0	81.9		ug/L		102	44 - 142
1,2-Dichlorobenzene	80.0	77.2		ug/L		96	32 - 129
1,3-Dichlorobenzene	80.0	75.3		ug/L		94	10 - 172
1,4-Dichlorobenzene	80.0	76.9		ug/L		96	20 - 124
2,2'-oxybis[1-chloropropane]	80.0	81.5		ug/L		102	36 - 166
2,4,6-Trichlorophenol	80.0	101		ug/L		126	37 - 144
2,4-Dichlorophenol	80.0	91.0		ug/L		114	39 - 135
2,4-Dimethylphenol	80.0	81.2		ug/L		102	32 - 119
2-Chloronaphthalene	80.0	97.3	Q	ug/L		122	60 - 118
2-Chlorophenol	80.0	73.3		ug/L		92	23 - 134
2-Nitrophenol	80.0	90.9		ug/L		114	29 - 182
3,3'-Dichlorobenzidine	160	149		ug/L		93	10 - 262
4,6-Dinitro-2-methylphenol	160	180		ug/L		113	10 - 181
4-Bromophenyl phenyl ether	80.0	94.8		ug/L		118	53 - 127
4-Chloro-3-methylphenol	80.0	83.1		ug/L		104	22 - 147
4-Chlorophenyl phenyl ether	80.0	84.0		ug/L		105	25 - 158
4-Nitrophenol	160	54.1		ug/L		34	10 - 132
Acenaphthene	80.0	87.5		ug/L		109	47 - 145
Acenaphthylene	80.0	90.9		ug/L		114	33 - 145
Anthracene	80.0	93.7		ug/L		117	27 - 133
Benzidine	160	59.4	J	ug/L		37	5 - 65
Benzo[a]anthracene	80.0	97.1		ug/L		121	33 - 143
Benzo[a]pyrene	80.0	93.7		ug/L		117	17 - 163
Benzo[b]fluoranthene	80.0	99.6		ug/L		125	24 - 159
Benzo[g,h,i]perylene	80.0	93.5		ug/L		117	10 - 219
Benzo[k]fluoranthene	80.0	93.3		ug/L		117	11 - 162
Bis(2-chloroethoxy)methane	80.0	89.1		ug/L		111	33 - 184
Bis(2-chloroethyl)ether	80.0	82.1		ug/L		103	12 - 158
Bis(2-ethylhexyl) phthalate	80.0	98.3		ug/L		123	10 - 158
Butyl benzyl phthalate	80.0	99.2		ug/L		124	10 - 152

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-635134/2-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 635134

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chrysene	80.0	100		ug/L		125	17 - 168
Dibenz(a,h)anthracene	80.0	101		ug/L		126	10 - 227
Diethyl phthalate	80.0	90.6		ug/L		113	10 - 114
Dimethyl phthalate	80.0	90.0		ug/L		112	10 - 112
Di-n-butyl phthalate	80.0	92.8		ug/L		116	10 - 118
Di-n-octyl phthalate	80.0	101		ug/L		127	10 - 146
Fluoranthene	80.0	92.4		ug/L		116	26 - 137
Fluorene	80.0	89.9		ug/L		112	59 - 121
Hexachlorobenzene	80.0	84.8		ug/L		106	10 - 152
Hexachlorobutadiene	80.0	80.6		ug/L		101	24 - 116
Hexachlorocyclopentadiene	160	180	Q	ug/L		112	10 - 68
Hexachloroethane	80.0	70.2		ug/L		88	40 - 113
Indeno[1,2,3-cd]pyrene	80.0	92.0		ug/L		115	10 - 171
Isophorone	80.0	85.2		ug/L		106	21 - 196
Naphthalene	80.0	83.8		ug/L		105	21 - 133
Nitrobenzene	80.0	84.1		ug/L		105	35 - 180
N-Nitrosodi-n-propylamine	80.0	83.9		ug/L		105	10 - 230
N-Nitrosodiphenylamine	80.0	96.3	Q	ug/L		120	46 - 114
Pentachlorophenol	160	140		ug/L		87	14 - 176
Phenanthrene	80.0	90.7		ug/L		113	54 - 120
Phenol	80.0	25.4		ug/L		32	10 - 112
Pyrene	80.0	96.3	Q	ug/L		120	55 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol	*87*		*50 - 120*
2-Fluorobiphenyl	*111*		*36 - 120*
2-Fluorophenol	*47*		*30 - 120*
Nitrobenzene-d5	*105*		*45 - 120*
Phenol-d5	*27*	*Q*	*36 - 120*
Terphenyl-d14	*117*		*52 - 120*

Lab Sample ID: LCSD 280-635134/3-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 635134

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	80.0	83.6		ug/L		105	44 - 142	2	35
1,2-Dichlorobenzene	80.0	78.0		ug/L		98	32 - 129	1	42
1,3-Dichlorobenzene	80.0	75.7		ug/L		95	10 - 172	1	47
1,4-Dichlorobenzene	80.0	76.9		ug/L		96	20 - 124	0	49
2,2'-oxybis[1-chloropropane]	80.0	74.3		ug/L		93	36 - 166	9	30
2,4,6-Trichlorophenol	80.0	97.3		ug/L		122	37 - 144	4	30
2,4-Dichlorophenol	80.0	90.5		ug/L		113	39 - 135	1	30
2,4-Dimethylphenol	80.0	77.5		ug/L		97	32 - 119	5	35
2-Chloronaphthalene	80.0	102	Q	ug/L		127	60 - 118	4	30
2-Chlorophenol	80.0	70.2		ug/L		88	23 - 134	4	30
2-Nitrophenol	80.0	87.1		ug/L		109	29 - 182	4	30
3,3'-Dichlorobenzidine	160	157		ug/L		98	10 - 262	5	50

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-635134/3-A
Matrix: Water
Analysis Batch: 635417

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 635134

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,6-Dinitro-2-methylphenol			160	189		ug/L		118	10 - 181	5	55
4-Bromophenyl phenyl ether			80.0	92.7		ug/L		116	53 - 127	2	34
4-Chloro-3-methylphenol			80.0	81.4		ug/L		102	22 - 147	2	30
4-Chlorophenyl phenyl ether			80.0	83.8		ug/L		105	25 - 158	0	30
4-Nitrophenol			160	56.7		ug/L		35	10 - 132	5	42
Acenaphthene			80.0	83.7		ug/L		105	47 - 145	4	30
Acenaphthylene			80.0	87.5		ug/L		109	33 - 145	4	30
Anthracene			80.0	91.1		ug/L		114	27 - 133	3	30
Benzidine			160	115	Q	ug/L		72	5 - 65	64	50
Benzo[a]anthracene			80.0	96.7		ug/L		121	33 - 143	0	30
Benzo[a]pyrene			80.0	91.5		ug/L		114	17 - 163	2	73
Benzo[b]fluoranthene			80.0	94.2		ug/L		118	24 - 159	6	90
Benzo[g,h,i]perylene			80.0	92.6		ug/L		116	10 - 219	1	64
Benzo[k]fluoranthene			80.0	94.3		ug/L		118	11 - 162	1	50
Bis(2-chloroethoxy)methane			80.0	84.2		ug/L		105	33 - 184	6	30
Bis(2-chloroethyl)ether			80.0	77.5		ug/L		97	12 - 158	6	30
Bis(2-ethylhexyl) phthalate			80.0	95.5		ug/L		119	10 - 158	3	30
Butyl benzyl phthalate			80.0	96.8		ug/L		121	10 - 152	2	30
Chrysene			80.0	99.4		ug/L		124	17 - 168	1	30
Dibenz(a,h)anthracene			80.0	98.8		ug/L		123	10 - 227	2	78
Diethyl phthalate			80.0	87.8		ug/L		110	10 - 114	3	30
Dimethyl phthalate			80.0	87.3		ug/L		109	10 - 112	3	30
Di-n-butyl phthalate			80.0	92.1		ug/L		115	10 - 118	1	30
Di-n-octyl phthalate			80.0	98.1		ug/L		123	10 - 146	3	30
Fluoranthene			80.0	93.1		ug/L		116	26 - 137	1	30
Fluorene			80.0	87.8		ug/L		110	59 - 121	2	30
Hexachlorobenzene			80.0	84.5		ug/L		106	10 - 152	0	30
Hexachlorobutadiene			80.0	82.9		ug/L		104	24 - 116	3	41
Hexachlorocyclopentadiene			160	196	Q	ug/L		122	10 - 68	8	82
Hexachloroethane			80.0	70.3		ug/L		88	40 - 113	0	52
Indeno[1,2,3-cd]pyrene			80.0	90.7		ug/L		113	10 - 171	2	73
Isophorone			80.0	80.5		ug/L		101	21 - 196	6	30
Naphthalene			80.0	82.3		ug/L		103	21 - 133	2	30
Nitrobenzene			80.0	77.4		ug/L		97	35 - 180	8	30
N-Nitrosodi-n-propylamine			80.0	78.9		ug/L		99	10 - 230	6	30
N-Nitrosodiphenylamine			80.0	93.5	Q	ug/L		117	46 - 114	3	50
Pentachlorophenol			160	157		ug/L		98	14 - 176	12	30
Phenanthrene			80.0	88.7		ug/L		111	54 - 120	2	30
Phenol			80.0	24.7		ug/L		31	10 - 112	3	30
Pyrene			80.0	96.4	Q	ug/L		121	55 - 115	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol	*88*		*50 - 120*
2-Fluorobiphenyl	*105*		*36 - 120*
2-Fluorophenol	*45*		*30 - 120*
Nitrobenzene-d5	*97*		*45 - 120*
Phenol-d5	*27*	*Q*	*36 - 120*
Terphenyl-d14	*118*		*52 - 120*

Method: 8015C DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 680-809167/1-A
Matrix: Water
Analysis Batch: 809504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 809167

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C10-C28	0.15	U	0.30	0.15	0.068	mg/L		11/21/23 19:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*56*	*M*	*56 - 125*	*11/20/23 07:59*	*11/21/23 19:46*	*1*

Lab Sample ID: LCS 680-809167/2-A
Matrix: Water
Analysis Batch: 809504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 809167

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C10-C28			4.00	2.52		mg/L		63	36 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl (Surr)	*88*	*M*	*56 - 125*

Lab Sample ID: LCSD 680-809167/3-A
Matrix: Water
Analysis Batch: 809504

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 809167

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C10-C28			4.00	2.03		mg/L		51	36 - 132	22	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl (Surr)	*74*	*M*	*56 - 125*

Method: 2540 D-2011 - Total Suspended Solids (Dried at 103-105°C)

Lab Sample ID: MB 680-809273/1
Matrix: Water
Analysis Batch: 809273

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Suspended Solids	2.5	U	2.5	2.5	2.5	mg/L		11/20/23 12:29	1

Lab Sample ID: LCS 680-809273/2
Matrix: Water
Analysis Batch: 809273

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			841	844		mg/L		100	80 - 120		

Lab Sample ID: LCSD 680-809273/3
Matrix: Water
Analysis Batch: 809273

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Suspended Solids			841	828		mg/L		98	80 - 120	2	25

Method: 2540 D-2011 - Total Suspended Solids (Dried at 103-105°C) (Continued)

Lab Sample ID: 680-243143-1 DU
Matrix: Water
Analysis Batch: 809273

Client Sample ID: DCL Leachate-Fal23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	8.3			9.33		mg/L				11	5

Method: 9065 - Phenolics, Total Recoverable

Lab Sample ID: MB 680-809469/1-A
Matrix: Water
Analysis Batch: 809577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 809469

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.050	U	0.050	0.050	0.025	mg/L		11/21/23 19:48	1

Lab Sample ID: LCS 680-809469/2-A
Matrix: Water
Analysis Batch: 809577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 809469

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenolics, Total Recoverable			0.100	0.102		mg/L		102	75 - 125		

Lab Sample ID: 680-243143-1 MS
Matrix: Water
Analysis Batch: 809577

Client Sample ID: DCL Leachate-Fal23
Prep Type: Total/NA
Prep Batch: 809469

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenolics, Total Recoverable	0.050	U J1	0.100	0.0624	J1	mg/L		62	75 - 125		

Lab Sample ID: 680-243143-1 MSD
Matrix: Water
Analysis Batch: 809577

Client Sample ID: DCL Leachate-Fal23
Prep Type: Total/NA
Prep Batch: 809469

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.050	U J1	0.100	0.0546	J1	mg/L		55	75 - 125	13	30

GC/MS Semi VOA

Prep Batch: 635134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	625	
MB 280-635134/1-A	Method Blank	Total/NA	Water	625	
LCS 280-635134/2-A	Lab Control Sample	Total/NA	Water	625	
LCSD 280-635134/3-A	Lab Control Sample Dup	Total/NA	Water	625	

Analysis Batch: 635417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	625	635134
MB 280-635134/1-A	Method Blank	Total/NA	Water	625	635134
LCS 280-635134/2-A	Lab Control Sample	Total/NA	Water	625	635134
LCSD 280-635134/3-A	Lab Control Sample Dup	Total/NA	Water	625	635134

GC Semi VOA

Prep Batch: 809167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	3510C	
MB 680-809167/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-809167/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 680-809167/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 809504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	8015C DRO	809167
MB 680-809167/1-A	Method Blank	Total/NA	Water	8015C DRO	809167
LCS 680-809167/2-A	Lab Control Sample	Total/NA	Water	8015C DRO	809167
LCSD 680-809167/3-A	Lab Control Sample Dup	Total/NA	Water	8015C DRO	809167

General Chemistry

Analysis Batch: 809273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	2540 D-2011	
MB 680-809273/1	Method Blank	Total/NA	Water	2540 D-2011	
LCS 680-809273/2	Lab Control Sample	Total/NA	Water	2540 D-2011	
LCSD 680-809273/3	Lab Control Sample Dup	Total/NA	Water	2540 D-2011	
680-243143-1 DU	DCL Leachate-Fal23	Total/NA	Water	2540 D-2011	

Prep Batch: 809469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	Distill/Phenol	
MB 680-809469/1-A	Method Blank	Total/NA	Water	Distill/Phenol	
LCS 680-809469/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
680-243143-1 MS	DCL Leachate-Fal23	Total/NA	Water	Distill/Phenol	
680-243143-1 MSD	DCL Leachate-Fal23	Total/NA	Water	Distill/Phenol	

Analysis Batch: 809577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1	DCL Leachate-Fal23	Total/NA	Water	9065	809469
MB 680-809469/1-A	Method Blank	Total/NA	Water	9065	809469
LCS 680-809469/2-A	Lab Control Sample	Total/NA	Water	9065	809469
680-243143-1 MS	DCL Leachate-Fal23	Total/NA	Water	9065	809469

General Chemistry (Continued)

Analysis Batch: 809577 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-243143-1 MSD	DCL Leachate-Fal23	Total/NA	Water	9065	809469

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Client Sample ID: DCL Leachate-Fal23

Date Collected: 11/14/23 09:30
Date Received: 11/15/23 10:07

Lab Sample ID: 680-243143-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	625			1047.2 mL	1 mL	635134	11/27/23 11:53	EDW	EET DEN
Total/NA	Analysis	625		1	500 uL	500 uL	635417	11/29/23 11:25	MAB	EET DEN
	Instrument ID: SMS_G6									
Total/NA	Prep	3510C			246.2 mL	1 mL	809167	11/20/23 07:59	DS	EET SAV
Total/NA	Analysis	8015C DRO		1	1 mL	1 mL	809504	11/21/23 20:43	DBM	EET SAV
	Instrument ID: CSGQ									
Total/NA	Analysis	2540 D-2011		1	300 mL	1000 mL	809273	11/20/23 12:29	AS	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Prep	Distill/Phenol			6 mL	6 mL	809469	11/21/23 11:17	SM	EET SAV
Total/NA	Analysis	9065		1	6 mL	6 mL	809577	11/21/23 19:48	SM	EET SAV
	Instrument ID: KONELAB3									

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-243143-1
Project/Site: Fort Devens, Long Term Monitoring

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, Long Term Monitoring

Job ID: 680-243143-1

Method	Method Description	Protocol	Laboratory
625	Semivolatile Organic Compounds (GC/MS)	EPA	EET DEN
8015C DRO	Diesel Range Organics (DRO) (GC)	SW846	EET SAV
2540 D-2011	Total Suspended Solids (Dried at 103-105°C)	SM	EET SAV
9065	Phenolics, Total Recoverable	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
625	Liquid-Liquid Extraction	EPA	EET DEN
Distill/Phenol	Distillation, Phenolics	None	EET SAV

Protocol References:

EPA = US Environmental Protection Agency

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # DCL-LEACH-FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023
Project Number: DEVNS-LTM PO 2312 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
M8015D (A) = Diesel Range
SW7470A (A) = Mercury
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide
SW9065 (A) = Phenolics

Equipment:

Code	Matrix
WL	Leachate

Code	Container/Preservative
1	2x 1L amber glass bottles, Cool to <6degC
2	2x 1L amber glass bottles, Cool to <6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
11	1x 500mL, amber glass, H2SO4; Cool < 6degC
21	1x 2-1 Liter, amber, glass, Cool < 6degC
29	3x 40mL glass VOA Vials, Cool < 6degC; adjust pH <2
33	2x 1 liter, amber, glass, Cool < 6degC
45	1x 500mL plastic, Cool < 6degC
48	1x 250mL plastic, NaOH to pH >12; Cool < 6degC

	Analytical Test Method	A2540D - TSS	E624 - VOCs	E625 - SVOCs	M8015D (A)	SW6010C - Fe Mn	SW6020A - As	SW7470A (A)	SW8081B (A)	SW8082A - PCB	SW9012B (A)	SW9040C - pH	SW9065 (A)
	Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023	45	29	33	21	9	9	9	21	1	48	2	11
	Sample ID	Matrix	Date	Time	Samp Init.														
1	DCL LEACHATE-FAL23	WL	11/7/23	1040	MS	X	X	X	X	X	X	X	X	X	X	X	DCL LEACHATE	N1	0.00	0.00	1	
2	DCL Leachate Fal23	WL	11/14/23	930	DC	X		X	X							X	DCL Leachate	N1	0.00	0.00	1	
3																						
4																						
5																						
6																						

	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	DCL LEACHATE	N1	0.00	0.00	1	
2	DCL Leachate	N1	0.00	0.00	1	

Turnaround Time: NA

11/13/23 1007 2.8/3.1

680-243143 Chain of Custody

11-14-23 1700

Relinquished by: (Signature)
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) DA 11-10-23 1006 2.2/2.5
Date
Time

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756763.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-243143-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 11/30/2023			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Fort Devens, Long Term Monitoring	Project #: 68023801			
Site:	SSOW#:			

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	625_DOD/625_Prep (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DCL Leachate Fal23 (680-243143-1)	11/14/23	09:30 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	TH	11-21-23			11.22.23 1020	EET DEN
2	Relinquished by:	Date/Time: 11:88	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.6 IR Gun

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243143-1

Login Number: 243143
List Number: 1
Creator: Johnson, Corey M

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-243143-1

Login Number: 243143
List Number: 2
Creator: Little, Matthew L

List Source: Eurofins Denver
List Creation: 11/22/23 01:12 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/5/2024 2:00:21 PM

JOB DESCRIPTION

Seres-Arcadis JV, LTM DCL, Fall 2023

JOB NUMBER

680-242830-1

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

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Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Job ID: 680-242830-1
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242830-1
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-242830-1	DCL-DUP01-FAL23	Water	11/07/23 10:35	11/10/23 10:06
680-242830-2	LFM-03-07-FAL23	Water	11/07/23 10:00	11/10/23 10:06
680-242830-3	LFM-99-02B-FAL23	Water	11/07/23 12:15	11/10/23 10:06
680-242830-4	LFM-99-05A-FAL23	Water	11/07/23 10:35	11/10/23 10:06
680-242830-5	LFM-99-06A-RP-FAL23	Water	11/07/23 08:52	11/10/23 10:06
680-242830-6	Trip Blank	Water	11/07/23 00:00	11/10/23 10:06

Job Narrative
680-242830-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/10/2023 10:06 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.7°C, 2.2°C, 2.5°C and 4.7°C

Subcontract Work
Method MAVPH: This method was subcontracted to Katahdin Analytical Services. The subcontract laboratory certification is different from that of the facility issuing the final report. The subcontract report is appended in its entirety.

GC Semi VOA
Method MAEPH_DOD: The breakthrough for naphthalene and 2-methylnaphthalene in the LCS and LCSD is <1%. The method requirement for breakthrough is 5% or less.

DCL-DUP01-FAL23 (680-242830-1), LFM-03-07-FAL23 (680-242830-2), LFM-99-02B-FAL23 (680-242830-3), LFM-99-02B-FAL23 (680-242830-3[MS]), LFM-99-02B-FAL23 (680-242830-3[MSD]), LFM-99-05A-FAL23 (680-242830-4) and LFM-99-06A-RP-FAL23 (680-242830-5)

Method MAEPH_DOD: The method blank for preparation batch 410-444549 and 410-445772 and analytical batch 410-446021 contained C11-C22 Aromatics (unadjusted) and C11-C22 Aromatics (Adjusted) above the method detection limit. This target analyte concentration was less than the limit of detection (LOD) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed. DCL-DUP01-FAL23 (680-242830-1), LFM-03-07-FAL23 (680-242830-2), LFM-99-02B-FAL23 (680-242830-3), LFM-99-02B-FAL23 (680-242830-3[MS]), LFM-99-02B-FAL23 (680-242830-3[MSD]), LFM-99-05A-FAL23 (680-242830-4) and LFM-99-06A-RP-FAL23 (680-242830-5)

Method MAEPH_DOD: The method blank for preparation batch 410-444549 and 410-445772 and analytical batch 410-446024 contained C19-C36 Aliphatics above the method detection limit. This target analyte concentration was less than the limit of detection (LOD) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed. DCL-DUP01-FAL23 (680-242830-1), LFM-03-07-FAL23 (680-242830-2), LFM-99-02B-FAL23 (680-242830-3), LFM-99-02B-FAL23 (680-242830-3[MS]), LFM-99-02B-FAL23 (680-242830-3[MSD]), LFM-99-05A-FAL23 (680-242830-4) and LFM-99-06A-RP-FAL23 (680-242830-5)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Pesticides/PCBs
Method 8081B_8082A_D5: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 680-808087 and analytical batch 680-808572 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

Job ID: 680-242830-1 (Continued) Eurofins Savannah

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 353.2_Pres: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for analytical batch 680-808934 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Method 410.4: The laboratory did not receive a preserved container for the following samples: DCL-DUP01-FAL23 (680-242830-1), LFM-03-07-FAL23 (680-242830-2), LFM-99-02B-FAL23 (680-242830-3), LFM-99-05A-FAL23 (680-242830-4) and LFM-99-06A-RP-FAL23 (680-242830-5). Therefore, an unpreserved sample was used and preservative was added to the aliquot at the bench top prior to analysis. The desired pH was achieved.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample ID: DCL-DUP01-FAL23
Lab Sample ID: 680-242830-1

Date Collected: 11/07/23 10:35
Matrix: Water
Date Received: 11/10/23 10:06

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
4,4'-DDE	0.0042	U M	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
4,4'-DDT	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
Aldrin	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
alpha-BHC	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
beta-BHC	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
delta-BHC	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Dieldrin	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Endosulfan I	0.0042	U M	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Endosulfan II	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Endosulfan sulfate	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Endrin	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
Endrin aldehyde	0.017	U M	0.053	0.017	0.0042	ug/L		11/16/23 17:52	1
Endrin ketone	**0.011**	**J**	0.053	0.017	0.0042	ug/L		11/16/23 17:52	1
gamma-BHC (Lindane)	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
Heptachlor	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 17:52	1
Heptachlor epoxide	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Methoxychlor	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 17:52	1
Chlordane (technical)	0.42	U M	0.53	0.42	0.17	ug/L		11/16/23 17:52	1
Toxaphene	0.85	U M	5.3	0.85	0.33	ug/L		11/16/23 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*79*		*14 - 130*	*11/14/23 10:36*	*11/16/23 17:52*	*1*
Tetrachloro-m-xylene	*51*		*44 - 124*	*11/14/23 10:36*	*11/16/23 17:52*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Pyrene	10	U Q	12	10	5.1	ug/L		11/21/23 19:19	1
Benzo[g,h,i]perylene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Indeno[1,2,3-cd]pyrene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Benzo[b]fluoranthene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Fluoranthene	1.0	U Q	2.1	1.0	0.51	ug/L		11/21/23 19:19	1
Benzo[k]fluoranthene	3.1	U Q	4.1	3.1	1.5	ug/L		11/21/23 19:19	1
Acenaphthylene	1.4	U Q	2.1	1.4	0.72	ug/L		11/21/23 19:19	1
Chrysene	1.0	U Q	2.1	1.0	0.51	ug/L		11/21/23 19:19	1
Benzo[a]pyrene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Dibenz(a,h)anthracene	1.0	U Q	2.1	1.0	0.51	ug/L		11/21/23 19:19	1
Benzo[a]anthracene	1.4	U Q	2.1	1.4	0.72	ug/L		11/21/23 19:19	1
Acenaphthene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Phenanthrene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Fluorene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
Naphthalene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
2-Methylnaphthalene	1.2	U Q	2.1	1.2	0.62	ug/L		11/21/23 19:19	1
C11-C22 Aromatics (unadjusted)	**10**	**J Q**	41	31	10	ug/L		11/21/23 19:19	1
C11-C22 Aromatics (Adjusted)	31	U	41	31	10	ug/L		11/21/23 19:19	1
C19-C36 Aliphatics	21	U	51	21	10	ug/L		11/21/23 19:19	1
C9-C18 Aliphatics	62	U	92	62	31	ug/L		11/21/23 19:19	1

Client Sample ID: DCL-DUP01-FAL23
Lab Sample ID: 680-242830-1

Date Collected: 11/07/23 10:35
Matrix: Water
Date Received: 11/10/23 10:06

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*69*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:19*	*1*
2-Fluorobiphenyl (Surr)	*81*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:19*	*1*
o- terphenyl (Surr)	*75*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:19*	*1*

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**170**		0.55	0.50	0.20	mg/L		11/26/23 14:27	1
Sulfate	**14**		1.5	1.0	0.40	mg/L		11/26/23 14:27	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**15**	**J**	20	10	4.4	ug/L		11/13/23 11:34	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/13/23 11:34	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/13/23 11:34	1
Copper	10	U	20	10	3.2	ug/L		11/13/23 11:34	1
Iron	50	U	100	50	20	ug/L		11/13/23 11:34	1
Lead	20	U	40	20	6.6	ug/L		11/13/23 11:34	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/13/23 11:34	1
Selenium	20	U	25	20	10	ug/L		11/13/23 11:34	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/13/23 11:34	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/14/23 01:14	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 10:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	**54**		5.5	5.0	2.2	mg/L		11/16/23 11:25	1
Total Dissolved Solids (SM 2540C-2011)	**400**		24	20	24	mg/L		11/13/23 11:51	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.025	U	0.10	0.025	0.010	mg/L		11/17/23 11:58	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		11/16/23 10:37	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:23	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-03-07-FAL23
Date Collected: 11/07/23 10:00
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-2
Matrix: Water

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
4,4'-DDE	0.0041	U M	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
4,4'-DDT	0.0041	U	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
Aldrin	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
alpha-BHC	0.0041	U	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
beta-BHC	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
delta-BHC	0.0041	U M	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Dieldrin	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Endosulfan I	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Endosulfan II	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Endosulfan sulfate	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Endrin	0.0041	U	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
Endrin aldehyde	0.016	U M	0.051	0.016	0.0041	ug/L		11/16/23 18:07	1
Endrin ketone	**0.016**	**J**	0.051	0.016	0.0041	ug/L		11/16/23 18:07	1
gamma-BHC (Lindane)	0.0041	U	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
Heptachlor	**0.0064**	**J**	0.051	0.0041	0.0010	ug/L		11/16/23 18:07	1
Heptachlor epoxide	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Methoxychlor	0.0041	U	0.051	0.0041	0.0021	ug/L		11/16/23 18:07	1
Chlordane (technical)	0.41	U M	0.51	0.41	0.16	ug/L		11/16/23 18:07	1
Toxaphene	0.82	U M	5.1	0.82	0.32	ug/L		11/16/23 18:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*83*		*14 - 130*	*11/14/23 10:36*	*11/16/23 18:07*	*1*
Tetrachloro-m-xylene	*46*		*44 - 124*	*11/14/23 10:36*	*11/16/23 18:07*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Pyrene	9.8	U Q	12	9.8	4.9	ug/L		11/21/23 19:41	1
Benzo[g,h,i]perylene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Indeno[1,2,3-cd]pyrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Benzo[b]fluoranthene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Fluoranthene	0.98	U Q	2.0	0.98	0.49	ug/L		11/21/23 19:41	1
Benzo[k]fluoranthene	2.9	U Q	3.9	2.9	1.5	ug/L		11/21/23 19:41	1
Acenaphthylene	1.4	U Q	2.0	1.4	0.68	ug/L		11/21/23 19:41	1
Chrysene	0.98	U Q	2.0	0.98	0.49	ug/L		11/21/23 19:41	1
Benzo[a]pyrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Dibenz(a,h)anthracene	0.98	U Q	2.0	0.98	0.49	ug/L		11/21/23 19:41	1
Benzo[a]anthracene	1.4	U Q	2.0	1.4	0.68	ug/L		11/21/23 19:41	1
Acenaphthene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Phenanthrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Fluorene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
Naphthalene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
2-Methylnaphthalene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 19:41	1
C11-C22 Aromatics (unadjusted)	29	U Q	39	29	9.8	ug/L		11/21/23 19:41	1
C11-C22 Aromatics (Adjusted)	29	U	39	29	9.8	ug/L		11/21/23 19:41	1
C19-C36 Aliphatics	**10**	**J**	49	20	9.8	ug/L		11/21/23 19:41	1
C9-C18 Aliphatics	**29**	**J**	88	59	29	ug/L		11/21/23 19:41	1

Client Sample ID: LFM-03-07-FAL23
Lab Sample ID: 680-242830-2

Date Collected: 11/07/23 10:00
Matrix: Water
Date Received: 11/10/23 10:06

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*69*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:41*	*1*
2-Fluorobiphenyl (Surr)	*79*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:41*	*1*
o- terphenyl (Surr)	*71*		*40 - 140*	*11/16/23 18:30*	*11/21/23 19:41*	*1*

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfate	**31**		1.5	1.0	0.40	mg/L		11/26/23 14:39	1

Method: SW846 9056A - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**200**	**D**	1.1	1.0	0.40	mg/L		11/26/23 16:33	2

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**13**	**J**	20	10	4.4	ug/L		11/13/23 11:36	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/13/23 11:36	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/13/23 11:36	1
Copper	10	U	20	10	3.2	ug/L		11/13/23 11:36	1
Iron	**83**	**J**	100	50	20	ug/L		11/13/23 11:36	1
Lead	20	U	40	20	6.6	ug/L		11/13/23 11:36	1
Manganese	**1.9**	**J**	10	5.0	1.3	ug/L		11/13/23 11:36	1
Selenium	20	U	25	20	10	ug/L		11/13/23 11:36	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/13/23 11:36	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.1**	**J**	5.0	3.0	0.86	ug/L		11/14/23 01:18	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 10:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	**110**		5.5	5.0	2.2	mg/L		11/16/23 11:25	1
Total Dissolved Solids (SM 2540C-2011)	**460**		24	20	24	mg/L		11/13/23 11:51	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.025	U	0.10	0.025	0.010	mg/L		11/17/23 12:00	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		11/16/23 10:37	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:23	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-02B-FAL23

Date Collected: 11/07/23 12:15
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-3

Matrix: Water

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0040	U J1	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
4,4'-DDE	0.0040	U	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
4,4'-DDT	0.0040	U J1	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
Aldrin	0.0040	U M	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
alpha-BHC	0.0040	U	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
beta-BHC	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
delta-BHC	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Dieldrin	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Endosulfan I	0.0040	U J1 M	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Endosulfan II	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Endosulfan sulfate	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Endrin	0.0040	U J1	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
Endrin aldehyde	0.016	U M	0.051	0.016	0.0040	ug/L		11/16/23 16:55	1
Endrin ketone	**0.018**	**J M J1**	0.051	0.016	0.0040	ug/L		11/16/23 16:55	1
gamma-BHC (Lindane)	0.0040	U	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
Heptachlor	0.0040	U	0.051	0.0040	0.0010	ug/L		11/16/23 16:55	1
Heptachlor epoxide	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Methoxychlor	0.0040	U	0.051	0.0040	0.0020	ug/L		11/16/23 16:55	1
Chlordane (technical)	0.40	U M	0.51	0.40	0.16	ug/L		11/16/23 16:55	1
Toxaphene	0.81	U M	5.1	0.81	0.31	ug/L		11/16/23 16:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*81*		*14 - 130*	*11/14/23 10:36*	*11/16/23 16:55*	*1*
Tetrachloro-m-xylene	*53*		*44 - 124*	*11/14/23 10:36*	*11/16/23 16:55*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Pyrene	9.9	U Q	12	9.9	4.9	ug/L		11/21/23 20:04	1
Benzo[g,h,i]perylene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Indeno[1,2,3-cd]pyrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Benzo[b]fluoranthene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Fluoranthene	0.99	U Q	2.0	0.99	0.49	ug/L		11/21/23 20:04	1
Benzo[k]fluoranthene	3.0	U Q	3.9	3.0	1.5	ug/L		11/21/23 20:04	1
Acenaphthylene	1.4	U Q	2.0	1.4	0.69	ug/L		11/21/23 20:04	1
Chrysene	0.99	U Q	2.0	0.99	0.49	ug/L		11/21/23 20:04	1
Benzo[a]pyrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Dibenz(a,h)anthracene	0.99	U Q	2.0	0.99	0.49	ug/L		11/21/23 20:04	1
Benzo[a]anthracene	1.4	U Q	2.0	1.4	0.69	ug/L		11/21/23 20:04	1
Acenaphthene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Phenanthrene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Fluorene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
Naphthalene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
2-Methylnaphthalene	1.2	U Q	2.0	1.2	0.59	ug/L		11/21/23 20:04	1
C11-C22 Aromatics (unadjusted)	30	U Q	39	30	9.9	ug/L		11/21/23 20:04	1
C11-C22 Aromatics (Adjusted)	30	U	39	30	9.9	ug/L		11/21/23 20:04	1
C19-C36 Aliphatics	20	U	49	20	9.9	ug/L		11/21/23 20:04	1
C9-C18 Aliphatics	59	U	89	59	30	ug/L		11/21/23 20:04	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-02B-FAL23

Date Collected: 11/07/23 12:15
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-3

Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	63		40 - 140	11/16/23 18:30	11/21/23 20:04	1
2-Fluorobiphenyl (Surr)	83		40 - 140	11/16/23 18:30	11/21/23 20:04	1
o- terphenyl (Surr)	68		40 - 140	11/16/23 18:30	11/21/23 20:04	1

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**180**		0.55	0.50	0.20	mg/L		11/26/23 14:50	1
Sulfate	**13**		1.5	1.0	0.40	mg/L		11/26/23 14:50	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**8.2**	**J J1**	20	10	4.4	ug/L		11/13/23 10:41	1
Cadmium	1.0	U J1	5.0	1.0	0.44	ug/L		11/13/23 10:41	1
Chromium	4.0	U J1	10	4.0	1.1	ug/L		11/13/23 10:41	1
Copper	10	U J1	20	10	3.2	ug/L		11/13/23 10:41	1
Iron	50	U	100	50	20	ug/L		11/13/23 10:41	1
Lead	20	U J1	40	20	6.6	ug/L		11/13/23 10:41	1
Manganese	5.0	U J1	10	5.0	1.3	ug/L		11/13/23 10:41	1
Selenium	20	U J1	25	20	10	ug/L		11/13/23 10:41	1
Silver	5.0	U J1	10	5.0	1.5	ug/L		11/13/23 10:41	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/14/23 00:17	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 10:09	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	**88**		5.5	5.0	2.2	mg/L		11/16/23 11:25	1
Total Dissolved Solids (SM 2540C-2011)	**380**		24	20	24	mg/L		11/13/23 11:51	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.025	U J1	0.10	0.025	0.010	mg/L		11/17/23 11:44	1
Chemical Oxygen Demand (EPA 410.4)	**13**	**J J1**	20	20	8.7	mg/L		11/16/23 10:37	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:23	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-05A-FAL23

Date Collected: 11/07/23 10:35
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-4

Matrix: Water

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
4,4'-DDE	0.0042	U M	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
4,4'-DDT	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
Aldrin	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
alpha-BHC	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
beta-BHC	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
delta-BHC	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Dieldrin	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Endosulfan I	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Endosulfan II	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Endosulfan sulfate	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Endrin	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
Endrin aldehyde	0.017	U M	0.053	0.017	0.0042	ug/L		11/16/23 18:21	1
Endrin ketone	**0.022**	**J**	0.053	0.017	0.0042	ug/L		11/16/23 18:21	1
gamma-BHC (Lindane)	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
Heptachlor	0.0042	U	0.053	0.0042	0.0011	ug/L		11/16/23 18:21	1
Heptachlor epoxide	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Methoxychlor	0.0042	U	0.053	0.0042	0.0021	ug/L		11/16/23 18:21	1
Chlordane (technical)	0.42	U M	0.53	0.42	0.17	ug/L		11/16/23 18:21	1
Toxaphene	0.84	U M	5.3	0.84	0.33	ug/L		11/16/23 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*85*		*14 - 130*	*11/14/23 10:36*	*11/16/23 18:21*	*1*
Tetrachloro-m-xylene	*51*		*44 - 124*	*11/14/23 10:36*	*11/16/23 18:21*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Pyrene	11	U Q	13	11	5.3	ug/L		11/21/23 21:11	1
Benzo[g,h,i]perylene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Indeno[1,2,3-cd]pyrene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Benzo[b]fluoranthene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Fluoranthene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:11	1
Benzo[k]fluoranthene	3.2	U Q	4.2	3.2	1.6	ug/L		11/21/23 21:11	1
Acenaphthylene	1.5	U Q	2.1	1.5	0.74	ug/L		11/21/23 21:11	1
Chrysene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:11	1
Benzo[a]pyrene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Dibenz(a,h)anthracene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:11	1
Benzo[a]anthracene	1.5	U Q	2.1	1.5	0.74	ug/L		11/21/23 21:11	1
Acenaphthene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Phenanthrene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Fluorene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
Naphthalene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
2-Methylnaphthalene	1.3	U Q	2.1	1.3	0.63	ug/L		11/21/23 21:11	1
C11-C22 Aromatics (unadjusted)	32	U Q	42	32	11	ug/L		11/21/23 21:11	1
C11-C22 Aromatics (Adjusted)	32	U	42	32	11	ug/L		11/21/23 21:11	1
C19-C36 Aliphatics	21	U	53	21	11	ug/L		11/21/23 21:11	1
C9-C18 Aliphatics	63	U M	95	63	32	ug/L		11/21/23 21:11	1

Client Sample ID: LFM-99-05A-FAL23
Lab Sample ID: 680-242830-4

Date Collected: 11/07/23 10:35
Matrix: Water
Date Received: 11/10/23 10:06

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*68*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:11*	*1*
2-Fluorobiphenyl (Surr)	*76*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:11*	*1*
o- terphenyl (Surr)	*68*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:11*	*1*

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**170**		0.55	0.50	0.20	mg/L		11/26/23 15:24	1
Sulfate	**14**		1.5	1.0	0.40	mg/L		11/26/23 15:24	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**14**	**J**	20	10	4.4	ug/L		11/13/23 10:53	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/13/23 10:53	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/13/23 10:53	1
Copper	10	U	20	10	3.2	ug/L		11/13/23 10:53	1
Iron	50	U	100	50	20	ug/L		11/13/23 10:53	1
Lead	20	U	40	20	6.6	ug/L		11/13/23 10:53	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/13/23 10:53	1
Selenium	20	U	25	20	10	ug/L		11/13/23 10:53	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/13/23 10:53	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/14/23 00:38	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 10:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	**110**		5.5	5.0	2.2	mg/L		11/16/23 11:25	1
Total Dissolved Solids (SM 2540C-2011)	**440**		24	20	24	mg/L		11/13/23 11:51	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.025	U	0.10	0.025	0.010	mg/L		11/17/23 12:02	1
Chemical Oxygen Demand (EPA 410.4)	**10**	**J**	20	20	8.7	mg/L		11/16/23 10:37	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:30	1

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-06A-RP-FAL23

Date Collected: 11/07/23 08:52
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-5

Matrix: Water

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
4,4'-DDE	0.0043	U M	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
4,4'-DDT	0.0043	U	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
Aldrin	0.0043	U M	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
alpha-BHC	0.0043	U	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
beta-BHC	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
delta-BHC	0.0043	U M	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Dieldrin	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Endosulfan I	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Endosulfan II	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Endosulfan sulfate	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Endrin	0.0043	U	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
Endrin aldehyde	0.017	U M	0.054	0.017	0.0043	ug/L		11/16/23 18:35	1
Endrin ketone	**0.022**	**J M**	0.054	0.017	0.0043	ug/L		11/16/23 18:35	1
gamma-BHC (Lindane)	0.0043	U	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
Heptachlor	**0.0031**	**J**	0.054	0.0043	0.0011	ug/L		11/16/23 18:35	1
Heptachlor epoxide	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Methoxychlor	0.0043	U	0.054	0.0043	0.0022	ug/L		11/16/23 18:35	1
Chlordane (technical)	0.43	U M	0.54	0.43	0.17	ug/L		11/16/23 18:35	1
Toxaphene	0.86	U M	5.4	0.86	0.33	ug/L		11/16/23 18:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*81*		*14 - 130*	*11/14/23 10:36*	*11/16/23 18:35*	*1*
Tetrachloro-m-xylene	*50*		*44 - 124*	*11/14/23 10:36*	*11/16/23 18:35*	*1*

Method: MA DEP MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Pyrene	11	U Q	13	11	5.3	ug/L		11/21/23 21:34	1
Benzo[g,h,i]perylene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Indeno[1,2,3-cd]pyrene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Benzo[b]fluoranthene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Fluoranthene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:34	1
Benzo[k]fluoranthene	3.2	U Q	4.2	3.2	1.6	ug/L		11/21/23 21:34	1
Acenaphthylene	1.5	U Q	2.1	1.5	0.74	ug/L		11/21/23 21:34	1
Chrysene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:34	1
Benzo[a]pyrene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Dibenz(a,h)anthracene	1.1	U Q	2.1	1.1	0.53	ug/L		11/21/23 21:34	1
Benzo[a]anthracene	1.5	U Q	2.1	1.5	0.74	ug/L		11/21/23 21:34	1
Acenaphthene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Phenanthrene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Fluorene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
Naphthalene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
2-Methylnaphthalene	1.3	U Q	2.1	1.3	0.64	ug/L		11/21/23 21:34	1
C11-C22 Aromatics (unadjusted)	32	U Q	42	32	11	ug/L		11/21/23 21:34	1
C11-C22 Aromatics (Adjusted)	32	U	42	32	11	ug/L		11/21/23 21:34	1
C19-C36 Aliphatics	21	U	53	21	11	ug/L		11/21/23 21:34	1
C9-C18 Aliphatics	64	U	95	64	32	ug/L		11/21/23 21:34	1

Client Sample ID: LFM-99-06A-RP-FAL23
Lab Sample ID: 680-242830-5

Date Collected: 11/07/23 08:52
Matrix: Water
Date Received: 11/10/23 10:06

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*61*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:34*	*1*
2-Fluorobiphenyl (Surr)	*78*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:34*	*1*
o- terphenyl (Surr)	*69*		*40 - 140*	*11/16/23 18:30*	*11/21/23 21:34*	*1*

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfate	**30**		1.5	1.0	0.40	mg/L		11/26/23 15:36	1

Method: SW846 9056A - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	**230**	**D**	2.8	2.5	1.0	mg/L		11/27/23 12:11	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	**4.7**	**J**	20	10	4.4	ug/L		11/13/23 11:26	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/13/23 11:26	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/13/23 11:26	1
Copper	10	U	20	10	3.2	ug/L		11/13/23 11:26	1
Iron	50	U	100	50	20	ug/L		11/13/23 11:26	1
Lead	20	U	40	20	6.6	ug/L		11/13/23 11:26	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/13/23 11:26	1
Selenium	20	U	25	20	10	ug/L		11/13/23 11:26	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/13/23 11:26	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/14/23 01:10	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 10:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B-2011)	**110**		5.5	5.0	2.2	mg/L		11/16/23 11:25	1
Total Dissolved Solids (SM 2540C-2011)	**510**		24	20	24	mg/L		11/13/23 11:51	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.025	U	0.10	0.025	0.010	mg/L		11/17/23 12:03	1
Chemical Oxygen Demand (EPA 410.4)	20	U	20	20	8.7	mg/L		11/16/23 10:37	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:30	1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-808087/1-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808087

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
4,4'-DDE	0.0040	U M	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
4,4'-DDT	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Aldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
alpha-BHC	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
beta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
delta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Dieldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan I	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan II	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endosulfan sulfate	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Endrin	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Endrin aldehyde	0.016	U M	0.050	0.016	0.0040	ug/L		11/16/23 13:17	1
Endrin ketone	0.016	U	0.050	0.016	0.0040	ug/L		11/16/23 13:17	1
gamma-BHC (Lindane)	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Heptachlor	0.0040	U	0.050	0.0040	0.0010	ug/L		11/16/23 13:17	1
Heptachlor epoxide	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Methoxychlor	0.0040	U	0.050	0.0040	0.0020	ug/L		11/16/23 13:17	1
Chlordane (technical)	0.40	U	0.50	0.40	0.16	ug/L		11/16/23 13:17	1
Toxaphene	0.80	U M	5.0	0.80	0.31	ug/L		11/16/23 13:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*38*		*14 - 130*	*11/14/23 10:36*	*11/16/23 13:17*	*1*
Tetrachloro-m-xylene	*46*	*M*	*44 - 124*	*11/14/23 10:36*	*11/16/23 13:17*	*1*

Lab Sample ID: LCS 680-808087/2-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808087

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0400	0.0288	J M	ug/L		72	56 - 143
4,4'-DDE	0.0400	0.0254	J M	ug/L		63	57 - 135
4,4'-DDT	0.0400	0.0221	J M	ug/L		55	51 - 143
Aldrin	0.0400	0.0182	J	ug/L		45	45 - 134
alpha-BHC	0.0400	0.0272	J	ug/L		68	54 - 138
beta-BHC	0.0400	0.0332	J	ug/L		83	56 - 136
delta-BHC	0.0400	0.0304	J	ug/L		76	52 - 142
Dieldrin	0.0400	0.0265	J	ug/L		66	60 - 136
Endosulfan I	0.0400	0.0256	J	ug/L		64	62 - 126
Endosulfan II	0.0400	0.0229	J	ug/L		57	52 - 135
Endosulfan sulfate	0.0400	0.0248	J	ug/L		62	62 - 133
Endrin	0.0400	0.0260	J	ug/L		65	60 - 138
Endrin aldehyde	0.0400	0.0254	J	ug/L		63	51 - 132
Endrin ketone	0.0400	0.0452	J	ug/L		113	58 - 134
gamma-BHC (Lindane)	0.0400	0.0275	J	ug/L		69	59 - 134
Heptachlor	0.0400	0.0411	J	ug/L		103	54 - 130
Heptachlor epoxide	0.0400	0.0268	J	ug/L		67	61 - 133
Methoxychlor	0.0400	0.0425	J M	ug/L		106	54 - 145

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-808087/2-A
Matrix: Water
Analysis Batch: 808572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808087

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	46		14 - 130
Tetrachloro-m-xylene	49		44 - 124

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 808572

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808087

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0040	U J1	0.0391	0.0221	J M	ug/L		56	56 - 143
4,4'-DDE	0.0040	U	0.0391	0.0254	J M	ug/L		65	57 - 135
4,4'-DDT	0.0040	U J1	0.0391	0.0187	J M J1	ug/L		48	51 - 143
Aldrin	0.0040	U M	0.0391	0.0181	J	ug/L		46	45 - 134
alpha-BHC	0.0040	U	0.0391	0.0237	J	ug/L		61	54 - 138
beta-BHC	0.0040	U	0.0391	0.0282	J	ug/L		72	56 - 136
delta-BHC	0.0040	U	0.0391	0.0312	J	ug/L		80	52 - 142
Dieldrin	0.0040	U	0.0391	0.0254	J	ug/L		65	60 - 136
Endosulfan I	0.0040	U J1 M	0.0391	0.0166	J J1	ug/L		42	62 - 126
Endosulfan II	0.0040	U	0.0391	0.0222	J M	ug/L		57	52 - 135
Endosulfan sulfate	0.0040	U	0.0391	0.0326	J	ug/L		83	62 - 133
Endrin	0.0040	U J1	0.0391	0.0208	J J1	ug/L		53	60 - 138
Endrin aldehyde	0.016	U M	0.0391	0.0265	J	ug/L		68	51 - 132
Endrin ketone	0.018	M J1	0.0391	0.0413	J M	ug/L		61	58 - 134
gamma-BHC (Lindane)	0.0040	U	0.0391	0.0241	J	ug/L		62	59 - 134
Heptachlor	0.0040	U	0.0391	0.0226	J	ug/L		58	54 - 130
Heptachlor epoxide	0.0040	U	0.0391	0.0283	J	ug/L		72	61 - 133
Methoxychlor	0.0040	U	0.0391	0.0287	J M	ug/L		73	54 - 145

Surrogate	MS %Recovery	MS Qualifier	Limits
DCB Decachlorobiphenyl	80		14 - 130
Tetrachloro-m-xylene	54		44 - 124

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808572

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808087

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,4'-DDD	0.0040	U J1	0.0406	0.0220	J M J1	ug/L		54	56 - 143	0	30
4,4'-DDE	0.0040	U	0.0406	0.0277	J M	ug/L		68	57 - 135	9	30
4,4'-DDT	0.0040	U J1	0.0406	0.0205	J	ug/L		51	51 - 143	9	30
Aldrin	0.0040	U M	0.0406	0.0214	J M	ug/L		53	45 - 134	17	30
alpha-BHC	0.0040	U	0.0406	0.0244	J M	ug/L		60	54 - 138	3	30
beta-BHC	0.0040	U	0.0406	0.0325	J	ug/L		80	56 - 136	14	30
delta-BHC	0.0040	U	0.0406	0.0346	J	ug/L		85	52 - 142	10	30
Dieldrin	0.0040	U	0.0406	0.0272	J M	ug/L		67	60 - 136	7	30
Endosulfan I	0.0040	U J1 M	0.0406	0.0187	J M J1	ug/L		46	62 - 126	12	30
Endosulfan II	0.0040	U	0.0406	0.0224	J	ug/L		55	52 - 135	1	30
Endosulfan sulfate	0.0040	U	0.0406	0.0378	J	ug/L		93	62 - 133	15	30
Endrin	0.0040	U J1	0.0406	0.0211	J M J1	ug/L		52	60 - 138	2	30

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808572

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808087

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin aldehyde	0.016	U M	0.0406	0.0277	J	ug/L		68	51 - 132	4	30
Endrin ketone	0.018	M J1	0.0406	0.0604	J1	ug/L		106	58 - 134	37	30
gamma-BHC (Lindane)	0.0040	U	0.0406	0.0251	J M	ug/L		62	59 - 134	4	30
Heptachlor	0.0040	U	0.0406	0.0243	J M	ug/L		60	54 - 130	7	30
Heptachlor epoxide	0.0040	U	0.0406	0.0264	J M	ug/L		65	61 - 133	7	30
Methoxychlor	0.0040	U	0.0406	0.0292	J	ug/L		72	54 - 145	2	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*77*		*14 - 130*
Tetrachloro-m-xylene	*51*	*M*	*44 - 124*

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 410-444549/1-B
Matrix: Water
Analysis Batch: 446024

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444549

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C19-C36 Aliphatics	12.8	J	50	20	10	ug/L		11/21/23 17:27	1
C9-C18 Aliphatics	60	U M	90	60	30	ug/L		11/21/23 17:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane (Surr)	*64*		*40 - 140*	*11/16/23 18:30*	*11/21/23 17:27*	*1*

Lab Sample ID: MB 410-444549/1-C
Matrix: Water
Analysis Batch: 446021

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444549

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Pyrene	10	U	12	10	5.0	ug/L		11/21/23 17:04	1
Benzo[g,h,i]perylene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Indeno[1,2,3-cd]pyrene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Benzo[b]fluoranthene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Fluoranthene	1.0	U	2.0	1.0	0.50	ug/L		11/21/23 17:04	1
Benzo[k]fluoranthene	3.0	U	4.0	3.0	1.5	ug/L		11/21/23 17:04	1
Acenaphthylene	1.4	U	2.0	1.4	0.70	ug/L		11/21/23 17:04	1
Chrysene	1.0	U	2.0	1.0	0.50	ug/L		11/21/23 17:04	1
Benzo[a]pyrene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Dibenz(a,h)anthracene	1.0	U	2.0	1.0	0.50	ug/L		11/21/23 17:04	1
Benzo[a]anthracene	1.4	U	2.0	1.4	0.70	ug/L		11/21/23 17:04	1
Acenaphthene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Phenanthrene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Fluorene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
Naphthalene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
2-Methylnaphthalene	1.2	U	2.0	1.2	0.60	ug/L		11/21/23 17:04	1
C11-C22 Aromatics (unadjusted)	15.3	J	40	30	10	ug/L		11/21/23 17:04	1
C11-C22 Aromatics (Adjusted)	14.4	J	40	30	10	ug/L		11/21/23 17:04	1

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 410-444549/1-C
Matrix: Water
Analysis Batch: 446021

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444549

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	83		40 - 140	11/16/23 18:30	11/21/23 17:04	1
o- terphenyl (Surr)	67		40 - 140	11/16/23 18:30	11/21/23 17:04	1

Lab Sample ID: LCS 410-444549/2-B
Matrix: Water
Analysis Batch: 446024

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
C19-C36 Aliphatics	321	248		ug/L		77	40 - 140
C9-C18 Aliphatics	241	159		ug/L		66	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1-Chlorooctadecane (Surr)	74		40 - 140

Lab Sample ID: LCS 410-444549/2-C
Matrix: Water
Analysis Batch: 446021

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Anthracene	40.1	31.4		ug/L		78	40 - 140
Pyrene	40.1	33.3		ug/L		83	40 - 140
Benzo[g,h,i]perylene	40.0	32.7		ug/L		82	40 - 140
Indeno[1,2,3-cd]pyrene	40.1	32.5	M	ug/L		81	40 - 140
Benzo[b]fluoranthene	40.2	33.4	M	ug/L		83	40 - 140
Fluoranthene	40.1	33.8		ug/L		84	40 - 140
Benzo[k]fluoranthene	40.1	34.0	M	ug/L		85	40 - 140
Acenaphthylene	40.1	32.2	M	ug/L		80	40 - 140
Chrysene	40.2	32.3	M	ug/L		80	40 - 140
Benzo[a]pyrene	40.2	30.8		ug/L		77	40 - 140
Dibenz(a,h)anthracene	40.0	32.2	M	ug/L		80	40 - 140
Benzo[a]anthracene	40.1	33.5	M	ug/L		84	40 - 140
Acenaphthene	40.2	30.7		ug/L		76	40 - 140
Phenanthrene	40.1	33.0		ug/L		82	40 - 140
Fluorene	40.1	31.7		ug/L		79	40 - 140
Naphthalene	40.1	29.8		ug/L		74	40 - 140
2-Methylnaphthalene	40.1	29.4		ug/L		73	40 - 140
C11-C22 Aromatics (unadjusted)	681	542	M	ug/L		80	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	100		40 - 140
o- terphenyl (Surr)	87		40 - 140

Lab Sample ID: LCSD 410-444549/3-B
Matrix: Water
Analysis Batch: 446024

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C19-C36 Aliphatics	321	207		ug/L		64	40 - 140	18	25

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 410-444549/3-B
Matrix: Water
Analysis Batch: 446024

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444549

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C9-C18 Aliphatics			241	164		ug/L		68	40 - 140	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*58*		*40 - 140*

Lab Sample ID: LCSD 410-444549/3-C
Matrix: Water
Analysis Batch: 446021

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444549

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene			40.1	22.8	Q	ug/L		57	40 - 140	32	25
Pyrene			40.1	23.2	Q	ug/L		58	40 - 140	36	25
Benzo[g,h,i]perylene			40.0	22.6	Q	ug/L		57	40 - 140	36	25
Indeno[1,2,3-cd]pyrene			40.1	21.8	Q	ug/L		54	40 - 140	39	25
Benzo[b]fluoranthene			40.2	23.4	Q	ug/L		58	40 - 140	35	25
Fluoranthene			40.1	23.5	Q	ug/L		59	40 - 140	36	25
Benzo[k]fluoranthene			40.1	23.5	Q	ug/L		59	40 - 140	37	25
Acenaphthylene			40.1	22.7	Q	ug/L		57	40 - 140	35	25
Chrysene			40.2	22.8	Q	ug/L		57	40 - 140	34	25
Benzo[a]pyrene			40.2	21.6	Q	ug/L		54	40 - 140	35	25
Dibenz(a,h)anthracene			40.0	23.1	Q	ug/L		58	40 - 140	33	25
Benzo[a]anthracene			40.1	23.1	Q	ug/L		58	40 - 140	37	25
Acenaphthene			40.2	21.9	Q	ug/L		55	40 - 140	33	25
Phenanthrene			40.1	23.4	Q	ug/L		58	40 - 140	34	25
Fluorene			40.1	22.8	Q	ug/L		57	40 - 140	33	25
Naphthalene			40.1	20.7	Q	ug/L		52	40 - 140	36	25
2-Methylnaphthalene			40.1	21.2	Q	ug/L		53	40 - 140	33	25
C11-C22 Aromatics (unadjusted)			681	379	Q	ug/L		56	40 - 140	35	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*82*		*40 - 140*
o- terphenyl (Surr)	*59*		*40 - 140*

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 446021

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Anthracene	1.2	U Q	38.2	29.0		ug/L		76	40 - 140
Pyrene	9.9	U Q	38.2	30.5		ug/L		80	40 - 140
Benzo[g,h,i]perylene	1.2	U Q	38.1	29.4		ug/L		77	40 - 140
Indeno[1,2,3-cd]pyrene	1.2	U Q	38.2	29.1	M	ug/L		76	40 - 140
Benzo[b]fluoranthene	1.2	U Q	38.3	30.9	M	ug/L		81	40 - 140
Fluoranthene	0.99	U Q	38.2	30.8		ug/L		81	40 - 140
Benzo[k]fluoranthene	3.0	U Q	38.2	30.8	M	ug/L		80	40 - 140
Acenaphthylene	1.4	U Q	38.2	30.3		ug/L		79	40 - 140
Chrysene	0.99	U Q	38.3	28.9		ug/L		76	40 - 140
Benzo[a]pyrene	1.2	U Q	38.3	28.4		ug/L		74	40 - 140

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 446021

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dibenz(a,h)anthracene	0.99	U Q	38.1	29.4	M	ug/L		77	40 - 140
Benzo[a]anthracene	1.4	U Q	38.2	30.8		ug/L		81	40 - 140
Acenaphthene	1.2	U Q	38.3	29.1		ug/L		76	40 - 140
Phenanthrene	1.2	U Q	38.2	30.5		ug/L		80	40 - 140
Fluorene	1.2	U Q	38.2	29.8		ug/L		78	40 - 140
Naphthalene	1.2	U Q	38.2	28.4		ug/L		74	40 - 140
2-Methylnaphthalene	1.2	U Q	38.2	28.4		ug/L		74	40 - 140
C11-C22 Aromatics (unadjusted)	30	U Q	649	497	M	ug/L		77	40 - 140
C19-C36 Aliphatics	20	U	306	215		ug/L		70	40 - 140
C9-C18 Aliphatics	59	U	230	148		ug/L		65	40 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*70*		*40 - 140*
2-Fluorobiphenyl (Surr)	*99*		*40 - 140*
o- terphenyl (Surr)	*85*		*40 - 140*

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 446021

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 444549

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Anthracene	1.2	U Q	38.2	25.6		ug/L		67	40 - 140	12	50
Pyrene	9.9	U Q	38.2	27.3		ug/L		71	40 - 140	11	50
Benzo[g,h,i]perylene	1.2	U Q	38.1	26.8		ug/L		70	40 - 140	9	50
Indeno[1,2,3-cd]pyrene	1.2	U Q	38.2	26.3	M	ug/L		69	40 - 140	10	50
Benzo[b]fluoranthene	1.2	U Q	38.3	28.2	M	ug/L		74	40 - 140	9	50
Fluoranthene	0.99	U Q	38.2	27.6		ug/L		72	40 - 140	11	50
Benzo[k]fluoranthene	3.0	U Q	38.2	27.3	M	ug/L		71	40 - 140	12	50
Acenaphthylene	1.4	U Q	38.2	26.2		ug/L		69	40 - 140	14	50
Chrysene	0.99	U Q	38.3	26.9		ug/L		70	40 - 140	7	50
Benzo[a]pyrene	1.2	U Q	38.3	25.5		ug/L		67	40 - 140	11	50
Dibenz(a,h)anthracene	0.99	U Q	38.1	26.8	M	ug/L		70	40 - 140	9	50
Benzo[a]anthracene	1.4	U Q	38.2	27.4		ug/L		72	40 - 140	12	50
Acenaphthene	1.2	U Q	38.3	25.2		ug/L		66	40 - 140	14	50
Phenanthrene	1.2	U Q	38.2	27.0		ug/L		71	40 - 140	12	50
Fluorene	1.2	U Q	38.2	25.9		ug/L		68	40 - 140	14	50
Naphthalene	1.2	U Q	38.2	24.6		ug/L		64	40 - 140	14	50
2-Methylnaphthalene	1.2	U Q	38.2	24.4		ug/L		64	40 - 140	15	50
C11-C22 Aromatics (unadjusted)	30	U Q	649	443	M	ug/L		68	40 - 140	12	50
C19-C36 Aliphatics	20	U	306	241		ug/L		79	40 - 140	11	50
C9-C18 Aliphatics	59	U	230	160		ug/L		70	40 - 140	8	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1-Chlorooctadecane (Surr)	*79*		*40 - 140*
2-Fluorobiphenyl (Surr)	*81*		*40 - 140*
o- terphenyl (Surr)	*76*		*40 - 140*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-809950/2
Matrix: Water
Analysis Batch: 809950

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	0.50	U	0.55	0.50	0.20	mg/L		11/26/23 13:08	1
Sulfate	1.0	U	1.5	1.0	0.40	mg/L		11/26/23 13:08	1

Lab Sample ID: LCS 680-809950/4
Matrix: Water
Analysis Batch: 809950

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.1		mg/L		101	87 - 111
Sulfate	10.0	9.45		mg/L		94	87 - 112

Lab Sample ID: LCSD 680-809950/5
Matrix: Water
Analysis Batch: 809950

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	10.0	10.1		mg/L		101	87 - 111	0	15
Sulfate	10.0	9.40		mg/L		94	87 - 112	0	15

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 809950

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	180		10.0	193	4	mg/L		91	87 - 111
Sulfate	13		10.0	22.7		mg/L		101	87 - 112

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 809950

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	180		10.0	193	4	mg/L		90	87 - 111	0	15
Sulfate	13		10.0	22.8	M	mg/L		101	87 - 112	0	15

Lab Sample ID: MB 680-810074/2
Matrix: Water
Analysis Batch: 810074

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	0.50	U	0.55	0.50	0.20	mg/L		11/27/23 11:25	1
Sulfate	1.0	U	1.5	1.0	0.40	mg/L		11/27/23 11:25	1

Lab Sample ID: LCS 680-810074/4
Matrix: Water
Analysis Batch: 810074

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.2		mg/L		102	87 - 111
Sulfate	10.0	9.58	M	mg/L		96	87 - 112

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCSD 680-810074/5
Matrix: Water
Analysis Batch: 810074

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			10.0	10.2		mg/L		102	87 - 111	0	15
Sulfate			10.0	9.63	M	mg/L		96	87 - 112	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-807783/1-A
Matrix: Water
Analysis Batch: 807907

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 807783

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	10	U	20	10	4.4	ug/L		11/13/23 10:36	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/13/23 10:36	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/13/23 10:36	1
Copper	10	U	20	10	3.2	ug/L		11/13/23 10:36	1
Iron	50	U	100	50	20	ug/L		11/13/23 10:36	1
Lead	20	U	40	20	6.6	ug/L		11/13/23 10:36	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/13/23 10:36	1
Selenium	20	U	25	20	10	ug/L		11/13/23 10:36	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/13/23 10:36	1

Lab Sample ID: LCS 680-807783/2-A
Matrix: Water
Analysis Batch: 807907

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 807783

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium			100	105		ug/L		105	88 - 113
Cadmium			50.0	52.2		ug/L		104	88 - 113
Chromium			100	104		ug/L		104	90 - 113
Copper			101	106		ug/L		105	86 - 114
Iron			4990	5100		ug/L		102	87 - 115
Lead			500	506		ug/L		101	86 - 113
Manganese			400	410		ug/L		103	90 - 114
Selenium			100	97.5		ug/L		98	83 - 114
Silver			50.0	50.6		ug/L		101	84 - 115

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 807907

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total Recoverable
Prep Batch: 807783

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	8.2	J1	100	112		ug/L		104	88 - 113
Cadmium	1.0	U J1	50.0	51.9		ug/L		104	88 - 113
Chromium	4.0	U J1	100	105		ug/L		104	90 - 113
Copper	10	U J1	101	106		ug/L		105	86 - 114
Iron	50	U	4990	5020		ug/L		101	87 - 115
Lead	20	U J1	500	501		ug/L		100	86 - 113
Manganese	5.0	U J1	400	405		ug/L		101	90 - 114
Selenium	20	U J1	100	104		ug/L		104	83 - 114
Silver	5.0	U J1	50.0	52.0		ug/L		104	84 - 115

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 807907

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total Recoverable
Prep Batch: 807783

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	8.2	J1	100	111		ug/L		103	88 - 113	1	20
Cadmium	1.0	U J1	50.0	51.8		ug/L		104	88 - 113	0	20
Chromium	4.0	U J1	100	104		ug/L		103	90 - 113	1	20
Copper	10	U J1	101	105		ug/L		103	86 - 114	1	20
Iron	50	U	4990	5000		ug/L		100	87 - 115	1	20
Lead	20	U J1	500	498		ug/L		100	86 - 113	1	20
Manganese	5.0	U J1	400	402		ug/L		101	90 - 114	1	20
Selenium	20	U J1	100	107		ug/L		107	83 - 114	3	20
Silver	5.0	U J1	50.0	51.7		ug/L		103	84 - 115	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-807784/1-A
Matrix: Water
Analysis Batch: 808049

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 807784

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/14/23 00:09	1

Lab Sample ID: LCS 680-807784/2-A
Matrix: Water
Analysis Batch: 808049

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 807784

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	109		ug/L		109	84 - 116

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 808049

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total Recoverable
Prep Batch: 807784

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	3.0	U	100	105		ug/L		105	84 - 116

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808049

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total Recoverable
Prep Batch: 807784

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	3.0	U	100	103		ug/L		103	84 - 116	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-808377/1-A
Matrix: Water
Analysis Batch: 808629

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808377

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/16/23 09:30	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 680-808377/2-A
Matrix: Water
Analysis Batch: 808629

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808377

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.40		ug/L		96	80 - 124

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 808629

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808377

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.20	U	1.00	0.933		ug/L		93	80 - 124

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808629

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808377

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.20	U	1.00	0.947		ug/L		95	80 - 124	1	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-808619/4
Matrix: Water
Analysis Batch: 808619

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	5.0	U	5.5	5.0	2.2	mg/L		11/16/23 11:25	1

Lab Sample ID: LCS 680-808619/6
Matrix: Water
Analysis Batch: 808619

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	250	244		mg/L		98	90 - 112

Lab Sample ID: LCSD 680-808619/31
Matrix: Water
Analysis Batch: 808619

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Alkalinity as CaCO3 to pH 4.5	250	249		mg/L		100	90 - 112	2	30

Method: 2540C-2011 - Total Dissolved Solids (Dried at 180 °C)

Lab Sample ID: MB 680-807892/1
Matrix: Water
Analysis Batch: 807892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Dissolved Solids	5.0	U	6.0	5.0	6.0	mg/L		11/13/23 11:51	1

Method: 2540C-2011 - Total Dissolved Solids (Dried at 180 °C) (Continued)

Lab Sample ID: LCS 680-807892/2
Matrix: Water
Analysis Batch: 807892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			2470	2400		mg/L		97	80 - 120		

Lab Sample ID: LCSD 680-807892/3
Matrix: Water
Analysis Batch: 807892

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Dissolved Solids			2470	2420		mg/L		98	80 - 120	1	25

Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-808934/14
Matrix: Water
Analysis Batch: 808934

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate Nitrite as N	0.025	U	0.10	0.025	0.010	mg/L		11/17/23 11:15	1

Lab Sample ID: LCS 680-808934/15
Matrix: Water
Analysis Batch: 808934

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N			1.00	1.02		mg/L		102	90 - 110		

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 808934

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate Nitrite as N	0.025	U J1	1.00	0.0120	J J1	mg/L		1	90 - 110		

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808934

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.025	U J1	1.00	0.0250	J J1	mg/L		3	90 - 110	70	10

Method: 410.4 - COD

Lab Sample ID: MB 280-634208/5
Matrix: Water
Analysis Batch: 634208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		11/16/23 10:37	1

Method: 410.4 - COD (Continued)

Lab Sample ID: LCS 280-634208/3
Matrix: Water
Analysis Batch: 634208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	100	94.3		mg/L		94	90 - 110

Lab Sample ID: LCSD 280-634208/4
Matrix: Water
Analysis Batch: 634208

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	100	98.8		mg/L		99	90 - 110	5	11

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 634208

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	13	J1	50.0	62.2		mg/L		99	90 - 110

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 634208

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	13	J1	50.0	59.2		mg/L		93	90 - 110	6	11

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-808284/12-A
Matrix: Water
Analysis Batch: 808340

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 808284

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		11/15/23 09:23	1

Lab Sample ID: LCS 680-808284/13-A
Matrix: Water
Analysis Batch: 808340

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 808284

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0542		mg/L		108	83 - 116

Lab Sample ID: 680-242830-3 MS
Matrix: Water
Analysis Batch: 808340

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808284

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0050	U	0.0500	0.0443		mg/L		89	83 - 116

Method: 9012B - Cyanide, Total and/or Amenable (Continued)

Lab Sample ID: 680-242830-3 MSD
Matrix: Water
Analysis Batch: 808340

Client Sample ID: LFM-99-02B-FAL23
Prep Type: Total/NA
Prep Batch: 808284

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.0050	U	0.0500	0.0516		mg/L		103	83 - 116	15	20

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Prep Batch: 444549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	3510C	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	3510C	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	3510C	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	3510C	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	3510C	
MB 410-444549/1-B	Method Blank	Total/NA	Water	3510C	
MB 410-444549/1-C	Method Blank	Total/NA	Water	3510C	
LCS 410-444549/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCS 410-444549/2-C	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-444549/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
LCSD 410-444549/3-C	Lab Control Sample Dup	Total/NA	Water	3510C	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	3510C	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	3510C	

Cleanup Batch: 445772

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	3630C	444549
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	3630C	444549
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	3630C	444549
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	3630C	444549
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	3630C	444549
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	3630C	444549
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	3630C	444549
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	3630C	444549
MB 410-444549/1-B	Method Blank	Total/NA	Water	3630C	444549
MB 410-444549/1-C	Method Blank	Total/NA	Water	3630C	444549
LCS 410-444549/2-B	Lab Control Sample	Total/NA	Water	3630C	444549
LCS 410-444549/2-C	Lab Control Sample	Total/NA	Water	3630C	444549
LCSD 410-444549/3-B	Lab Control Sample Dup	Total/NA	Water	3630C	444549
LCSD 410-444549/3-C	Lab Control Sample Dup	Total/NA	Water	3630C	444549
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	3630C	444549

Analysis Batch: 446021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	MA-EPH	445772
MB 410-444549/1-C	Method Blank	Total/NA	Water	MA-EPH	445772
LCS 410-444549/2-C	Lab Control Sample	Total/NA	Water	MA-EPH	445772
LCSD 410-444549/3-C	Lab Control Sample Dup	Total/NA	Water	MA-EPH	445772
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772

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Analysis Batch: 446024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	MA-EPH	445772
MB 410-444549/1-B	Method Blank	Total/NA	Water	MA-EPH	445772
LCS 410-444549/2-B	Lab Control Sample	Total/NA	Water	MA-EPH	445772
LCSD 410-444549/3-B	Lab Control Sample Dup	Total/NA	Water	MA-EPH	445772
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	MA-EPH	445772

Prep Batch: 808087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	3510C	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	3510C	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	3510C	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	3510C	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	3510C	
MB 680-808087/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-808087/2-A	Lab Control Sample	Total/NA	Water	3510C	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	3510C	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	3510C	

Analysis Batch: 808572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	8081B 8082A	808087
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	8081B 8082A	808087
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	8081B 8082A	808087
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	8081B 8082A	808087
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	8081B 8082A	808087
MB 680-808087/1-A	Method Blank	Total/NA	Water	8081B 8082A	808087
LCS 680-808087/2-A	Lab Control Sample	Total/NA	Water	8081B 8082A	808087
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	8081B 8082A	808087
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	8081B 8082A	808087

HPLC/IC

Analysis Batch: 809950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	9056A	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	9056A	
680-242830-2 - DL	LFM-03-07-FAL23	Total/NA	Water	9056A	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	9056A	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	9056A	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	9056A	
MB 680-809950/2	Method Blank	Total/NA	Water	9056A	
LCS 680-809950/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-809950/5	Lab Control Sample Dup	Total/NA	Water	9056A	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	9056A	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	9056A	

HPLC/IC

Analysis Batch: 810074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-5 - DL	LFM-99-06A-RP-FAL23	Total/NA	Water	9056A	
MB 680-810074/2	Method Blank	Total/NA	Water	9056A	
LCS 680-810074/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-810074/5	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 807783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total Recoverable	Water	3005A	
680-242830-2	LFM-03-07-FAL23	Total Recoverable	Water	3005A	
680-242830-3	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	
680-242830-4	LFM-99-05A-FAL23	Total Recoverable	Water	3005A	
680-242830-5	LFM-99-06A-RP-FAL23	Total Recoverable	Water	3005A	
MB 680-807783/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-807783/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-242830-3 MS	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	
680-242830-3 MSD	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	

Prep Batch: 807784

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total Recoverable	Water	3005A	
680-242830-2	LFM-03-07-FAL23	Total Recoverable	Water	3005A	
680-242830-3	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	
680-242830-4	LFM-99-05A-FAL23	Total Recoverable	Water	3005A	
680-242830-5	LFM-99-06A-RP-FAL23	Total Recoverable	Water	3005A	
MB 680-807784/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-807784/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-242830-3 MS	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	
680-242830-3 MSD	LFM-99-02B-FAL23	Total Recoverable	Water	3005A	

Analysis Batch: 807907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total Recoverable	Water	6010C	807783
680-242830-2	LFM-03-07-FAL23	Total Recoverable	Water	6010C	807783
680-242830-3	LFM-99-02B-FAL23	Total Recoverable	Water	6010C	807783
680-242830-4	LFM-99-05A-FAL23	Total Recoverable	Water	6010C	807783
680-242830-5	LFM-99-06A-RP-FAL23	Total Recoverable	Water	6010C	807783
MB 680-807783/1-A	Method Blank	Total Recoverable	Water	6010C	807783
LCS 680-807783/2-A	Lab Control Sample	Total Recoverable	Water	6010C	807783
680-242830-3 MS	LFM-99-02B-FAL23	Total Recoverable	Water	6010C	807783
680-242830-3 MSD	LFM-99-02B-FAL23	Total Recoverable	Water	6010C	807783

Analysis Batch: 808049

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total Recoverable	Water	6020A	807784
680-242830-2	LFM-03-07-FAL23	Total Recoverable	Water	6020A	807784
680-242830-3	LFM-99-02B-FAL23	Total Recoverable	Water	6020A	807784
680-242830-4	LFM-99-05A-FAL23	Total Recoverable	Water	6020A	807784
680-242830-5	LFM-99-06A-RP-FAL23	Total Recoverable	Water	6020A	807784
MB 680-807784/1-A	Method Blank	Total Recoverable	Water	6020A	807784

Metals (Continued)

Analysis Batch: 808049 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-807784/2-A	Lab Control Sample	Total Recoverable	Water	6020A	807784
680-242830-3 MS	LFM-99-02B-FAL23	Total Recoverable	Water	6020A	807784
680-242830-3 MSD	LFM-99-02B-FAL23	Total Recoverable	Water	6020A	807784

Prep Batch: 808377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	7470A	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	7470A	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	7470A	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	7470A	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	7470A	
MB 680-808377/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-808377/2-A	Lab Control Sample	Total/NA	Water	7470A	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	7470A	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	7470A	

Analysis Batch: 808629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	7470A	808377
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	7470A	808377
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	7470A	808377
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	7470A	808377
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	7470A	808377
MB 680-808377/1-A	Method Blank	Total/NA	Water	7470A	808377
LCS 680-808377/2-A	Lab Control Sample	Total/NA	Water	7470A	808377
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	7470A	808377
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	7470A	808377

General Chemistry

Analysis Batch: 634208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	410.4	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	410.4	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	410.4	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	410.4	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	410.4	
MB 280-634208/5	Method Blank	Total/NA	Water	410.4	
LCS 280-634208/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-634208/4	Lab Control Sample Dup	Total/NA	Water	410.4	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	410.4	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	410.4	

Analysis Batch: 807892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	2540C-2011	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	2540C-2011	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	2540C-2011	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	2540C-2011	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	2540C-2011	
MB 680-807892/1	Method Blank	Total/NA	Water	2540C-2011	

General Chemistry (Continued)

Analysis Batch: 807892 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-807892/2	Lab Control Sample	Total/NA	Water	2540C-2011	
LCSD 680-807892/3	Lab Control Sample Dup	Total/NA	Water	2540C-2011	

Prep Batch: 808284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	9012B	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	9012B	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	9012B	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	9012B	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	9012B	
MB 680-808284/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-808284/13-A	Lab Control Sample	Total/NA	Water	9012B	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	9012B	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	9012B	

Analysis Batch: 808340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	9012B	808284
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	9012B	808284
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	9012B	808284
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	9012B	808284
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	9012B	808284
MB 680-808284/12-A	Method Blank	Total/NA	Water	9012B	808284
LCS 680-808284/13-A	Lab Control Sample	Total/NA	Water	9012B	808284
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	9012B	808284
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	9012B	808284

Analysis Batch: 808619

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	2320B-2011	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	2320B-2011	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	2320B-2011	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	2320B-2011	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	2320B-2011	
MB 680-808619/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-808619/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-808619/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Analysis Batch: 808934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-242830-1	DCL-DUP01-FAL23	Total/NA	Water	353.2-1993 R2.0	
680-242830-2	LFM-03-07-FAL23	Total/NA	Water	353.2-1993 R2.0	
680-242830-3	LFM-99-02B-FAL23	Total/NA	Water	353.2-1993 R2.0	
680-242830-4	LFM-99-05A-FAL23	Total/NA	Water	353.2-1993 R2.0	
680-242830-5	LFM-99-06A-RP-FAL23	Total/NA	Water	353.2-1993 R2.0	
MB 680-808934/14	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-808934/15	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
680-242830-3 MS	LFM-99-02B-FAL23	Total/NA	Water	353.2-1993 R2.0	
680-242830-3 MSD	LFM-99-02B-FAL23	Total/NA	Water	353.2-1993 R2.0	

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: DCL-DUP01-FAL23

Date Collected: 11/07/23 10:35
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			235.8 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 17:52	UI	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			975 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446021	11/21/23 19:19	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			975 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446024	11/21/23 19:19	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Analysis	9056A		1	5 mL	5 mL	809950	11/26/23 14:27	T1C	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	807783	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			807907	11/13/23 11:34	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	807784	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808049	11/14/23 01:14	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	808377	11/15/23 12:00	DW	EET SAV
Total/NA	Analysis	7470A		1			808629	11/16/23 10:01	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			808619	11/16/23 11:25	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	807892	11/13/23 11:51	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	808934	11/17/23 11:58	AF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	634208	11/16/23 10:37	CLP	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	808284	11/15/23 07:51	JAS	EET SAV
Total/NA	Analysis	9012B		1			808340	11/15/23 09:23	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-03-07-FAL23

Date Collected: 11/07/23 10:00
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			243.1 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 18:07	UI	EET SAV
	Instrument ID: CSGAA									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-03-07-FAL23

Lab Sample ID: 680-242830-2

Date Collected: 11/07/23 10:00

Matrix: Water

Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1024.6 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446021	11/21/23 19:41	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			1024.6 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446024	11/21/23 19:41	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Analysis	9056A		1	5 mL	5 mL	809950	11/26/23 14:39	T1C	EET SAV
	Instrument ID: CICK									
Total/NA	Analysis	9056A	DL	2	5 mL	5 mL	809950	11/26/23 16:33	T1C	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	807783	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			807907	11/13/23 11:36	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	807784	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808049	11/14/23 01:18	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	808377	11/15/23 12:00	DW	EET SAV
Total/NA	Analysis	7470A		1			808629	11/16/23 10:03	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			808619	11/16/23 11:25	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	807892	11/13/23 11:51	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	808934	11/17/23 12:00	AF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	634208	11/16/23 10:37	CLP	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	808284	11/15/23 07:51	JAS	EET SAV
Total/NA	Analysis	9012B		1			808340	11/15/23 09:23	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-99-02B-FAL23

Lab Sample ID: 680-242830-3

Date Collected: 11/07/23 12:15

Matrix: Water

Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			247 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 16:55	UI	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			1013.4 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446021	11/21/23 20:04	UHEW	ELLE
	Instrument ID: 18433-W									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-02B-FAL23

Date Collected: 11/07/23 12:15
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1013.4 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446024	11/21/23 20:04	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Analysis	9056A		1	5 mL	5 mL	809950	11/26/23 14:50	T1C	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	807783	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			807907	11/13/23 10:41	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	807784	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808049	11/14/23 00:17	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	808377	11/15/23 12:00	DW	EET SAV
Total/NA	Analysis	7470A		1			808629	11/16/23 10:09	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			808619	11/16/23 11:25	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	807892	11/13/23 11:51	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	808934	11/17/23 11:44	AF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	634208	11/16/23 10:37	CLP	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	808284	11/15/23 07:51	JAS	EET SAV
Total/NA	Analysis	9012B		1			808340	11/15/23 09:23	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-99-05A-FAL23

Date Collected: 11/07/23 10:35
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			237.8 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 18:21	UI	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			945.3 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446021	11/21/23 21:11	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			945.3 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446024	11/21/23 21:11	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Analysis	9056A		1	5 mL	5 mL	809950	11/26/23 15:24	T1C	EET SAV
	Instrument ID: CICK									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-05A-FAL23

Lab Sample ID: 680-242830-4

Date Collected: 11/07/23 10:35

Matrix: Water

Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	807783	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			807907	11/13/23 10:53	BJB	EET SAV
	Instrument ID: ICPH									
Total Recoverable	Prep	3005A			25 mL	125 mL	807784	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808049	11/14/23 00:38	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	808377	11/15/23 12:00	DW	EET SAV
Total/NA	Analysis	7470A		1			808629	11/16/23 10:15	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			808619	11/16/23 11:25	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	807892	11/13/23 11:51	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	808934	11/17/23 12:02	AF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	634208	11/16/23 10:37	CLP	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	808284	11/15/23 07:51	JAS	EET SAV
Total/NA	Analysis	9012B		1			808340	11/15/23 09:30	JAS	EET SAV
	Instrument ID: KONELAB4									

Client Sample ID: LFM-99-06A-RP-FAL23

Lab Sample ID: 680-242830-5

Date Collected: 11/07/23 08:52

Matrix: Water

Date Received: 11/10/23 10:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			232.3 mL	1 mL	808087	11/14/23 10:36	DS	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	808572	11/16/23 18:35	UI	EET SAV
	Instrument ID: CSGAA									
Total/NA	Prep	3510C			944.5 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446021	11/21/23 21:34	UHEW	ELLE
	Instrument ID: 18433-W									
Total/NA	Prep	3510C			944.5 mL	1 mL	444549	11/16/23 18:30	K2IL	ELLE
Total/NA	Cleanup	3630C			1.0 mL	1.0 mL	445772	11/21/23 07:21	YDF5	ELLE
Total/NA	Analysis	MA-EPH		1	1 mL	1 mL	446024	11/21/23 21:34	UHEW	ELLE
	Instrument ID: 18433-X									
Total/NA	Analysis	9056A		1	5 mL	5 mL	809950	11/26/23 15:36	T1C	EET SAV
	Instrument ID: CICK									
Total/NA	Analysis	9056A	DL	5	5 mL	5 mL	810074	11/27/23 12:11	UI	EET SAV
	Instrument ID: CICK									
Total Recoverable	Prep	3005A			25 mL	25 mL	807783	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6010C		1			807907	11/13/23 11:26	BJB	EET SAV
	Instrument ID: ICPH									

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Client Sample ID: LFM-99-06A-RP-FAL23

Date Collected: 11/07/23 08:52
Date Received: 11/10/23 10:06

Lab Sample ID: 680-242830-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	125 mL	807784	11/13/23 05:47	RR	EET SAV
Total Recoverable	Analysis	6020A		1			808049	11/14/23 01:10	BWR	EET SAV
	Instrument ID: ICPMSC									
Total/NA	Prep	7470A			50 mL	50 mL	808377	11/15/23 12:00	DW	EET SAV
Total/NA	Analysis	7470A		1			808629	11/16/23 10:18	DW	EET SAV
	Instrument ID: QuickTrace2									
Total/NA	Analysis	2320B-2011		1			808619	11/16/23 11:25	PG	EET SAV
	Instrument ID: MANTECH 2									
Total/NA	Analysis	2540C-2011		1	50 mL	200 mL	807892	11/13/23 11:51	PG	EET SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	808934	11/17/23 12:03	AF	EET SAV
	Instrument ID: SEAL 1									
Total/NA	Analysis	410.4		1	2 mL	2 mL	634208	11/16/23 10:37	CLP	EET DEN
	Instrument ID: WC_Genesys20									
Total/NA	Prep	9012B			6 mL	6 mL	808284	11/15/23 07:51	JAS	EET SAV
Total/NA	Analysis	9012B		1			808340	11/15/23 09:30	JAS	EET SAV
	Instrument ID: KONELAB4									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Job ID: 680-242830-1
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-24

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM DCL, Fall 2023

Job ID: 680-242830-1

Method	Method Description	Protocol	Laboratory
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
MA-EPH	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	ELLE
9056A	Anions, Ion Chromatography	SW846	EET SAV
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
7470A	Mercury (CVAA)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
2540C-2011	Total Dissolved Solids (Dried at 180 °C)	SM	EET SAV
353.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAWW	EET SAV
410.4	COD	EPA	EET DEN
9012B	Cyanide, Total and/or Amenable	EPA	EET SAV
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3630C	Silica Gel Cleanup	SW846	ELLE
7470A	Preparation, Mercury	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET SAV

Protocol References:

EPA = US Environmental Protection Agency
MA DEP = Massachusetts Department Of Environmental Protection
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858
ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.	Project #:
Project Location: Fort Devens	RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SQ6279-1 through -6

Matrices: X Groundwater/Surface Water Soil/Sediment Drinking Water Air Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A	7470/7471 Hg CAM III B	MassDEP VPH CAM IV A **X**	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes X No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes X No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes No Yes No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes No[1]

***Data User Note**: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	X Yes No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes No[1]

[1]*All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Q.A. Officer

Printed Name: Jennifer Prescott

Date: 01/05/2024

TEST AMERICA SAVANNAH

SERES-ARCADIS JB, LTM DCL, FALL 2023

SQ6279

Jennifer Prescott
207-874-2400

KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074

SAMPLE DATA PACKAGE

NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
SERES-ARCADIS JB, LTM DCL, FALL 2023
SQ6279

Sample Receipt

The following samples were received on November 14, 2023 and were logged in under Katahdin Analytical Services work order number SQ6279 for a hardcopy due date of December 05, 2023.

KATAHDIN Sample No.	TEST AMERICA SAVANNAH Sample Identification
SQ6279-1	DCL-DUP01-FAL23
SQ6279-2	LFM-03-07-FAL23
SQ6279-3	LFM-99-02B-FAL23
SQ6279-4	LFM-99-05A-FAL23
SQ6279-5	LFM-99-06A-RP-FAL23
SQ6279-6	TRIP BLANK

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be "^" flagged and the following language will be included in the case narrative for all DoD compliant work: "^" Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Heather Manz**. This narrative is an integral part of the Report of Analysis.

Organics Analysis

The samples of Work Order SQ6279 were analyzed in accordance with Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MADEP, May 2004, Revision 1.1. and/or for the specific methods listed below or on the Report of Analysis.

Sample SQ6279-3 was used for the matrix spike (MS) and matrix spike duplicate (MSD) per the client's request.

MA VPH Analysis

Samples SQ6279-1 and 6 were manually integrated for the surrogate 2,5-dibromotoluene on the PID and/or FID. The specific reason for the manual integration is indicated on the raw data by the manual integration codes (M1-M11). These codes are further explained in the attachment following this narrative.

Due to analyst oversight, sample SQ6279-6 was analyzed 24 days outside of analytical hold time.

The opening and closing calibration verification (CV) standards (Files 2QK10036 and 2QK10048) had low responses for the target analyte n-pentane that resulted in %D's that exceeded the method acceptance limits of ±25%. Since the overall range was acceptable, no further action was taken.

The independent check standard (file 2QI10012), associated with the initial calibration analyzed on the GC02 instrument on 9/8/23 had a high concentration for the target analyte naphthalene on the PID, which exceeded the laboratory acceptance limit of ±20% of the expected value from the ICAL.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

_____

Jennifer Prescott
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

Katahdin Analytical Services, LLC. **Sample Receipt Condition Report**

Client: Pace	KAS PM: HHM	Sampled By: Client
Project:	KIMS Entry By: JCB	Delivered By: FedEx
KAS Work Order#: SO 6278, 6279, 6280	KIMS Review By: HHM	Received By: EP
	Labeled By: EP	
SDG #:	Cooler: 1 of 1	Date/Time Rec.: 11-14-23 0930

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	/				
2. Chain of Custody present in cooler?	/				
3. Chain of Custody signed by client?	/				
4. Chain of Custody matches samples?	/				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	/				Temp (°C): 3.2° — Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	/				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	/				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	/				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				/	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles: **Aqueous:** No bubble larger than a pea?	/				
Soil/Sediment: Received in airtight container?				/	
Received in methanol?				/	
Methanol covering soil?				/	
D.I. Water - Received within 48 hour HT?				/	
7. Trip Blank present in cooler?	/				
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2				/	
Sulfide - >9				/	
Cyanide – pH >12				/	
11. Bottleware Prepped on:					

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

SQ 6279

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756091.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242830-1
Address: 600 Technology Way, ,	Due Date Requested: 11/22/2023			
City: Scarborough	TAT Requested (days):			
State, Zip: ME, 04074				
Phone:	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM DCL, Fall 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (MAVPH)/ MAVPH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DCL-DUP01-FAL23 (680-242830-1)	11/7/23	10:35 Eastern		Water			X	3	
LFM-03-07-FAL23 (680-242830-2)	11/7/23	10:00 Eastern		Water			X	3	
LFM-99-02B-FAL23 (680-242830-3MS)	11/7/23	12:15 Eastern	MS	Water			X	3	
LFM-99-02B-FAL23 (680-242830-3MSD)	11/7/23	12:15 Eastern	MSD	Water			X	3	
LFM-99-05A-FAL23 (680-242830-4)	11/7/23	10:35 Eastern		Water			X	3	
LFM-99-06A-RP-FAL23 (680-242830-5)	11/7/23	08:52 Eastern		Water			X	3	
Trip Blank (680-242830-6)	11/7/23	Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	TH	11-13-23			11-14-23 0930	Eurofins
2	Relinquished by:	Date/Time: 16:00	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

SQ 6280 (JCB) 11/24
6279

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756092.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242830-1
Address: 600 Technology Way, ,	Due Date Requested: 11/22/2023			
City: Scarborough	TAT Requested (days):			
State, Zip: ME, 04074				
Phone:	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM DCL, Fall 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (MAVPH)/ MAVPH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
LFM-99-02B-FAL23 (680-242830-3)	11/7/23	12:15 Eastern		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
TH	16:00			11-14-23 0930	Katahdin
Relinquished by:	Date/Time: 11-13-23	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Login Number: SQ6279

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Primary Report Address:

Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:

Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah,GA 31404

email project manager and
beth.daughtry@et.eurofinsus.com

Report CC Addresses:
Invoice CC Addresses:

Quote/Incoming: TASAV-DEVENS

Login Information

ANALYSIS INSTRUCTIONS	:	FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.
CHECK NO.	:	
CLIENT PO#	:	US1672979726
CLIENT PROJECT MANAGE	:	Jerry Lanier
CONTRACT	:	68023801, 680-242830
COOLER TEMPERATURE	:	3.2
DELIVERY SERVICES	:	FedEx
EDD FORMAT	:	ECC-091317-TXT
ISM INSTRUCTIONS	:	
LOGIN INITIALS	:	JCB
PM	:	HHM
PROJECT NAME	:	Seres-Arcadis JB, LTM DCL, Fall 2023
QC LEVEL	:	IV
REPORT INSTRUCTIONS	:	SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinsus.com. No HC.
SDG ID	:	
SDG STATUS	:	
TEMPLATE	:	
VERBAL TAT	:	

Run Reports: Logindetail

Login Number: SQ6279

Account: TESTAMERICASAVLAB001
Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SQ6279-1	DCL-DUP01-FAL23	07-NOV-23 10:35	14-NOV-23		05-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
Service	S REPORTING						
SQ6279-2	LFM-03-07-FAL23	07-NOV-23 10:00	14-NOV-23		05-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-3	LFM-99-02B-FAL23	07-NOV-23 12:15	14-NOV-23		05-DEC-23		
Sample Comments:	MS/MSD						
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-4	LFM-99-05A-FAL23	07-NOV-23 10:35	14-NOV-23		05-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-5	LFM-99-06A-RP-FAL23	07-NOV-23 08:52	14-NOV-23		05-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-6	TRIP BLANK	07-NOV-23 00:00	14-NOV-23		05-DEC-23		
Sample Comments:							
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-7	MS CHARGE LFM-99-02B-FAL23	07-NOV-23 12:15	14-NOV-23		05-DEC-23		
Sample Comments:	Not a sample, MS charge for SQ6279-3.						
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		
SQ6279-8	MSD CHARGE LFM-99-02B-FAL23	07-NOV-23 12:15	14-NOV-23		05-DEC-23		
Sample Comments:	Not a sample, MSD charge for SQ6279-3.						
Matrix	***Product***	***Hold Date (shortest)***	***Notes***		***Bottle Type***		
Aqueous	S MA-VPH-LOD	21-NOV-23			40mL Vial+HCl		

Total Samples: 8 ***Total Analyses: 9***

Run Reports: Logindetail

SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL, "U" LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Practical Quantitation Level (PQL) (also called Limit of Quantitation (LOQ)), but above the Method Detection Limit (MDL).

And/or

J Used for Dual Column analytes when there is a greater than 40% difference for detected concentrations between the two GC/HPLC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

I Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration (ICAL).

D Indicates that the flagged compound did not meet DoD criteria in the corresponding Initial Calibration Verification (ICV).

C Indicates that the flagged compound did not meet DoD criteria in the corresponding opening Calibration Verification (CV).

V Indicates that the flagged compound did not meet DoD criteria in the corresponding closing Calibration Verification (CV).

L/LL Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M/MM Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike (MS) and/or Matrix Spike Duplicate MSD) prepared and/or analyzed concurrently with the native sample.

H Indicates the flagged compound was detected on the primary column but was not detected on the confirmation column therefore the compound is not reported as a positive detection. (SW846 8330A/B only)

Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-1
Client ID: DCL-DUP01-FAL23
Matrix: AQ
Lab File ID: 2QK10041.D

Sample Date: 07-NOV-23
Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		75.4	%					
2,5-Dibromotoluene (PID)		73.0	%					

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http://www.katahdinlab.com

Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-2
Client ID: LFM-03-07-FAL23
Matrix: AQ
Lab File ID: 2QK10042.D

Sample Date: 07-NOV-23
Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		88.2	%					
2,5-Dibromotoluene (PID)		87.6	%					

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Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-3
Client ID: LFM-99-02B-FAL23
Matrix: AQ
Lab File ID: 2QK10043.D

Sample Date: 07-NOV-23
Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		88.1	%					
2,5-Dibromotoluene (PID)		90.6	%					

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Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-4
Client ID: LFM-99-05A-FAL23
Matrix: AQ
Lab File ID: 2QK10046.D

Sample Date: 07-NOV-23
Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		102.	%					
2,5-Dibromotoluene (PID)		103.	%					

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http://www.katahdinlab.com

Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-5
Client ID: LFM-99-06A-RP-FAL23
Matrix: AQ
Lab File ID: 2QK10047.D

Sample Date: 07-NOV-23
Extract Date: 16-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 16-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		97.8	%					
2,5-Dibromotoluene (PID)		97.3	%					

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Report of Analytical Results

SDG: SQ6279
Lab ID: SQ6279-6
Client ID: TRIP BLANK
Matrix: AQ
Lab File ID: 2QL10055.D

Sample Date: 07-NOV-23
Extract Date: 15-DEC-23
Extracted By: DL/SH
Extraction Method: MA-VPH
Lab Prep Batch: WG347010

Report Date: 21-DEC-23
Analysis Date: 15-DEC-23
Analyst: DL/SH
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		87.1	%					
2,5-Dibromotoluene (PID)		82.3	%					

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Report of Analytical Results

SDG: SQ6279
Lab ID: WG345505-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QK10037.D

Sample Date: N/A
Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505

Report Date: 01-DEC-23
Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		79.4	%					
2,5-Dibromotoluene (PID)		84.0	%					

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Report of Analytical Results

SDG: SQ6279
Lab ID: WG347010-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2QL10051.D

Sample Date: N/A
Extract Date: 15-DEC-23
Extracted By: DL/SH
Extraction Method: MA-VPH
Lab Prep Batch: WG347010

Report Date: 27-DEC-23
Analysis Date: 15-DEC-23
Analyst: DL/SH
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		85.1	%					
2,5-Dibromotoluene (PID)		79.3	%					

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Form 2
System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SQ6279 **Matrix:** AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
DCL-DUP01-FAL23	SQ6279-1	B	75.4	73.0
LFM-03-07-FAL23	SQ6279-2	B	88.2	87.6
LFM-99-02B-FAL23	SQ6279-3	B	88.1	90.6
LFM-99-05A-FAL23	SQ6279-4	B	102.	103.
LFM-99-06A-RP-FAL23	SQ6279-5	B	97.8	97.3
TRIP BLANK	SQ6279-6	B	87.1	82.3
Method Blank	WG345505-1	B	79.4	84.0
Laboratory Control S	WG345505-2	B	108.	113.
Laboratory Control S	WG345505-3	B	112.	117.
Matrix Spike	WG345505-4	B	107.	108.
Matrix Spike Duplica	WG345505-5	B	108.	107.
Method Blank	WG347010-1	B	85.1	79.3
Laboratory Control S	WG347010-2	B	87.1	88.9
Laboratory Control S	WG347010-3	B	90.0	90.0

Abbr.	Surrogate Compound	QC Limits
DBT-FID	2,5-Dibromotoluene (FID)	70-130
DBT-PID	2,5-Dibromotoluene (PID)	70-130

= Column to be used to flag recovery limits.
* = Values outside of contract required QC limits.
D= System Monitoring Compound diluted out.

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LCS/LCSD Recovery Report

LCS ID: WG345505-2
LCSD ID: WG345505-3
SDG: SQ6279
LCS File ID: 2QK10038.D

Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505
LCSD File ID: 2QK10039.D

Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 01-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	291.	97.0	297.	99.0	ug/L	2	25	70-130
Unadjusted C9-C12 Aliphatics	200.	237.	118.	236.	118.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	113.	113.	115.	115.	ug/L	2	25	70-130
Benzene	100.	101.	101.	101.	101.	ug/L	0	25	70-130
Ethylbenzene	100.	105.	105.	106.	106.	ug/L	1	25	70-130
Methyl tert-butylether	100.	97.6	97.6	98.4	98.4	ug/L	1	25	70-130
Naphthalene	100.	109.	109.	111.	111.	ug/L	2	25	70-130
Toluene	100.	103.	103.	104.	104.	ug/L	1	25	70-130
m+p-Xylenes	200.	205.	102.	207.	104.	ug/L	1	25	70-130
o-Xylene	100.	107.	107.	108.	108.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			108.		112.				70-130
2,5-Dibromotoluene (PID)			113.		117.				70-130

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LCS/LCSD Recovery Report

LCS ID: WG347010-2
LCSD ID: WG347010-3
SDG: SQ6279
LCS File ID: 2QL10053.D

Extract Date: 15-DEC-23
Extracted By: DL/SH
Extraction Method: MA-VPH
Lab Prep Batch: WG347010
LCSD File ID: 2QL10054.D

Analysis Date: 15-DEC-23
Analyst: DL/SH
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 27-DEC-23

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300.	296.	98.7	266.	88.7	ug/L	11	25	70-130
Unadjusted C9-C12 Aliphatics	200.	232.	116.	223.	112.	ug/L	4	25	70-130
C9-C10 Aromatics	100.	109.	109.	109.	109.	ug/L	0	25	70-130
Benzene	100.	97.5	97.5	98.0	98.0	ug/L	0	25	70-130
Ethylbenzene	100.	101.	101.	102.	102.	ug/L	1	25	70-130
Methyl tert-butylether	100.	91.8	91.8	93.4	93.4	ug/L	2	25	70-130
Naphthalene	100.	104.	104.	100.	100.	ug/L	4	25	70-130
Toluene	100.	99.6	99.6	100.	100.	ug/L	0	25	70-130
m+p-Xylenes	200.	198.	99.0	197.	98.5	ug/L	0	25	70-130
o-Xylene	100.	103.	103.	102.	102.	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			104.		108.				70-130
2,5-Dibromotoluene (PID)			105.		99.6				70-130

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MS/MSD Recovery Report

MS ID: WG345505-4
MSD ID: WG345505-5
Sample ID: SQ6279-3
Client ID: LFM-99-02B-FAL23
SDG: SQ6279
MS File ID: 2QK10044.D

Extract Date: 15-NOV-23
Extracted By: DL
Extraction Method: MA-VPH
Lab Prep Batch: WG345505
Report Date: 01-DEC-23
MSD File ID: 2QK10045.D

Analysis Date: 15-NOV-23
Analyst: DL
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
% Solids: N/A
Sample File ID: 2QK10043.D

Compound	MS Spike	MSD Spike	Conc Units	Samp Conc	MS Conc	MSD Conc	MS Rec (%)	MSD Rec (%)	RPD (%)	RPD Limit	Limits
Unadjusted C5-C8 Aliphatics	300	300	ug/L	U75	339	349	113.	116.	3	50	70-130
Unadjusted C9-C12 Aliphatics	200	200	ug/L	U75	237	242	118.	121.	2	50	70-130
C9-C10 Aromatics	100	100	ug/L	U75	112	111	112.	111.	1	50	70-130
Benzene	100	100	ug/L	U2.0	102	102	102.	102.	0	50	70-130
Ethylbenzene	100	100	ug/L	U3.8	106	106	106.	106.	0	50	70-130
Methyl tert-butylether	100	100	ug/L	U3.8	92.9	92.3	92.9	92.3	1	50	70-130
Naphthalene	100	100	ug/L	U3.8	104	102	104.	102.	2	50	70-130
Toluene	100	100	ug/L	U3.8	104	104	104.	104.	0	50	70-130
m+p-Xylenes	200	200	ug/L	U7.5	206	207	103.	104.	0	50	70-130
o-Xylene	100	100	ug/L	U3.8	106	106	106.	106.	0	50	70-130
2,5-Dibromotoluene (FID)							107.	108.			70-130
2,5-Dibromotoluene (PID)							108.	107.			70-130

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Form 4
Method Blank Summary

Lab File ID : 2QK10037.D
SDG : SQ6279
Instrument ID : GC02
Lab Sample ID : WG345505-1
Heated Purge : No
Date Analyzed : 15-NOV-23
Prep Temperature (C) : N/A
Time Analyzed : 16:24

This Method Blank applies to the following samples and QC samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	
Laboratory Control S	WG345505-2	2QK10038.	11/15/23	17:05	
Laboratory Control S	WG345505-3	2QK10039.	11/15/23	17:46	
DCL-DUP01-FAL23	SQ6279-1	2QK10041.	11/15/23	19:56	
LFM-03-07-FAL23	SQ6279-2	2QK10042.	11/15/23	20:38	
LFM-99-02B-FAL23	SQ6279-3	2QK10043.	11/15/23	21:20	
Matrix Spike	WG345505-4	2QK10044.	11/15/23	22:03	
Matrix Spike Duplica	WG345505-5	2QK10045.	11/15/23	22:45	
LFM-99-05A-FAL23	SQ6279-4	2QK10046.	11/15/23	23:28	
LFM-99-06A-RP-FAL23	SQ6279-5	2QK10047.	11/16/23	00:10	

Form 4
Method Blank Summary

Lab File ID : 2QL10051.D
SDG : SQ6279
Instrument ID : GC02
Lab Sample ID : WG347010-1
Heated Purge : No
Date Analyzed : 15-DEC-23
Prep Temperature (C) : N/A
Time Analyzed : 18:47

This Method Blank applies to the following samples and QC samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	
Laboratory Control S	WG347010-2	2QL10053.	12/15/23	20:11	
Laboratory Control S	WG347010-3	2QL10054.	12/15/23	20:54	
TRIP BLANK	SQ6279-6	2QL10055.	12/15/23	21:36	

Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6279

Instrument ID: GC02 **Column ID:** A

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C9-C10 Aromatic	967	830	925	1037	1086	770	AVG		936		12.8704	25	O
Methyl tert-butylether	643	650	664	672	675	484	AVG		631		11.5901	25	O
Benzene	1284	1153	1230	1239	1246	873	AVG		1171		12.9925	25	O
Toluene	1077	998	1087	1130	1135	790	AVG		1036		12.5836	25	O
Ethylbenzene	1031	825	912	984	1004	700	AVG		909		13.9320	25	O
m+p-Xylene	1280	1073	1172	1224	1227	847	AVG		1137		13.9357	25	O
o-Xylene	980	914	1008	1056	1063	743	AVG		961		12.4781	25	O
1,2,4-trimethylbenzene	967	830	925	1037	1086	770	AVG		936		12.8704	25	O
Naphthalene	1131	931	965	1148	1264	1053	AVG		1082		11.4766	25	O
2,5-Dibromotoluene (PID)	868	610	669	803	920	714	AVG		764		15.6928	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

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Form 6
Initial Calibration Summary

Lab Name : Katahdin Analytical Services **SDG:** SQ6279

Instrument ID: GC02 **Column ID:** B

Lab File IDs : 2QI10007.D 2QI10008.D 2QI10009.D 2QI10006.D 2QI10010.D 2QI10011.D **Calibration Date(s):** 08-SEP-23 11:40 08-SEP-23 15:06

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Curve				%RSD or R^2		
	1.0000	5.0000	10.0000	50.0000	100.0000	300.0000	Type	b	m1	m2	Result	Limit	
C5-C8 Aliphatic	1368	1462	1510	1515	1550	1110	AVG		1419		11.55808	25	O
C9-C12 Aliphatic	1382	987	1139	1412	1613	1351	AVG		1314		16.76788	25	O
n-Pentane	1678	1360	1331	1423	1436	1022	AVG		1375		15.42459	25	O
2-Methylpentane	1325	1489	1568	1504	1565	1104	AVG		1426		12.68114	25	O
Methyl tert-butylether	1263	1466	1350	1342	1364	980	AVG		1294		12.92115	25	O
2,2,4-Trimethylpentane	1102	1535	1630	1619	1650	1205	AVG		1457		16.50443	25	O
Benzene	2236	1912	2014	2062	2078	1440	AVG		1957		14.02254	25	O
Toluene	2246	1805	1973	2008	2022	1402	AVG		1909		14.97234	25	O
n-Nonane	1233	1074	1149	1315	1445	1251	AVG		1244		10.38257	25	O
n-Decane	1302	833	875	1165	1553	1352	AVG		1180		23.90207	25	O
Ethylbenzene	1982	1598	1747	1898	1949	1366	AVG		1757		13.60981	25	O
m+p-Xylene	2144	1814	1973	2094	2091	1446	AVG		1927		13.69605	25	O
o-Xylene	2030	1823	2010	2129	2137	1484	AVG		1935		12.83633	25	O
1,2,4-trimethylbenzene	1886	1537	1710	1887	1985	1413	AVG		1736		12.94449	25	O
n-Butylcyclohexane	1461	1141	1402	1660	1673	1350	AVG		1448		13.85802	25	O
Naphthalene	1511	1246	1284	1588	1686	1382	AVG		1450		12.03582	25	O
2,5-Dibromotoluene (FID)	653	397	443	529	572	438	AVG		505		19.17753	25	

Legend: O = Acceptable; W = Failed %RSD Value; X = Failed R^2 Value; Y = Failed Minimum RF

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG345505-6
Analytical Date: 11/15/23 11:50
Lab File ID: 2QK10036.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1020	1020	0.100	9.01948	25.000	Averaged	
Methyl tert-butylether	631	638	638	0.100	1.13102	25.000	Averaged	
Benzene	1171	1194	1194	0.100	2.00498	25.000	Averaged	
Toluene	1036	1107	1107	0.100	6.86161	25.000	Averaged	
Ethylbenzene	909	965	965	0.100	6.12663	25.000	Averaged	
m+p-Xylene	1137	1195	1195	0.100	5.11898	25.000	Averaged	
o-Xylene	961	1038	1038	0.100	8.03612	25.000	Averaged	
1,2,4-trimethylbenzene	936	1020	1020	0.100	9.01779	25.000	Averaged	
Naphthalene	1082	1081	1081	0.100	-0.07677	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	739	739	0.100	-3.28710	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG345505-6
Analytical Date: 11/15/23 11:50
Lab File ID: 2QK10036.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1237	1237	0.100	-12.84930	25.000	Averaged	
C9-C12 Aliphatic	1314	1372	1372	0.100	4.42826	25.000	Averaged	
n-Pentane	1375	841	841	0.100	-38.82820	25.000	Averaged	*
2-Methylpentane	1426	1265	1265	0.100	-11.28928	25.000	Averaged	
Methyl tert-butylether	1294	1375	1375	0.100	6.28504	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1605	1605	0.100	10.14292	25.000	Averaged	
Benzene	1957	2126	2126	0.100	8.66053	25.000	Averaged	
Toluene	1909	2107	2107	0.100	10.36828	25.000	Averaged	
n-Nonane	1244	1339	1339	0.100	7.61078	30.000	Averaged	
n-Decane	1180	1120	1120	0.100	-5.06905	25.000	Averaged	
Ethylbenzene	1757	1999	1999	0.100	13.76726	25.000	Averaged	
m+p-Xylene	1927	2195	2195	0.100	13.90813	25.000	Averaged	
o-Xylene	1935	2243	2243	0.100	15.87075	25.000	Averaged	
1,2,4-trimethylbenzene	1736	1982	1982	0.100	14.14904	25.000	Averaged	
n-Butylcyclohexane	1448	1624	1624	0.100	12.16906	25.000	Averaged	
Naphthalene	1450	1540	1540	0.100	6.24772	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	523	523	0.100	3.59459	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG345505-7
Analytical Date: 11/16/23 00:52
Lab File ID: 2QK10048.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1026	1026	0.100	9.66316	25.000	Averaged	
Methyl tert-butylether	631	645	645	0.100	2.14173	25.000	Averaged	
Benzene	1171	1183	1183	0.100	1.04838	25.000	Averaged	
Toluene	1036	1099	1099	0.100	6.07600	25.000	Averaged	
Ethylbenzene	909	961	961	0.100	5.72412	25.000	Averaged	
m+p-Xylene	1137	1194	1194	0.100	5.00554	25.000	Averaged	
o-Xylene	961	1038	1038	0.100	8.02363	25.000	Averaged	
1,2,4-trimethylbenzene	936	1026	1026	0.100	9.66110	25.000	Averaged	
Naphthalene	1082	1125	1125	0.100	4.02368	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	815	815	0.100	6.68392	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG345505-7
Analytical Date: 11/16/23 00:52
Lab File ID: 2QK10048.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1160	1160	0.100	-18.26800	25.000	Averaged	
C9-C12 Aliphatic	1314	1263	1263	0.100	-3.84179	25.000	Averaged	
n-Pentane	1375	768	768	0.100	-44.15191	25.000	Averaged	*
2-Methylpentane	1426	1194	1194	0.100	-16.25973	25.000	Averaged	
Methyl tert-butylether	1294	1420	1420	0.100	9.76235	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1518	1518	0.100	4.19578	25.000	Averaged	
Benzene	1957	2151	2151	0.100	9.91672	25.000	Averaged	
Toluene	1909	2109	2109	0.100	10.46047	25.000	Averaged	
n-Nonane	1244	1228	1228	0.100	-1.30562	30.000	Averaged	
n-Decane	1180	1013	1013	0.100	-14.16384	25.000	Averaged	
Ethylbenzene	1757	2010	2010	0.100	14.41279	25.000	Averaged	
m+p-Xylene	1927	2172	2172	0.100	12.71599	25.000	Averaged	
o-Xylene	1935	2239	2239	0.100	15.69301	25.000	Averaged	
1,2,4-trimethylbenzene	1736	2018	2018	0.100	16.22245	25.000	Averaged	
n-Butylcyclohexane	1448	1514	1514	0.100	4.57122	25.000	Averaged	
Naphthalene	1450	1650	1650	0.100	13.82206	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	560	560	0.100	10.82994	25.000	Averaged	

*** = Compound out of QC criteria**

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG347010-4
Analytical Date: 12/15/23 13:56
Lab File ID: 2QL10047.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1039	1039	0.100	11.01787	25.000	Averaged	
Methyl tert-butylether	631	631	631	0.100	-0.08880	25.000	Averaged	
Benzene	1171	1223	1223	0.100	4.47849	25.000	Averaged	
Toluene	1036	1125	1125	0.100	8.53898	25.000	Averaged	
Ethylbenzene	909	982	982	0.100	7.97862	25.000	Averaged	
m+p-Xylene	1137	1217	1217	0.100	7.02998	25.000	Averaged	
o-Xylene	961	1051	1051	0.100	9.37681	25.000	Averaged	
1,2,4-trimethylbenzene	936	1039	1039	0.100	11.01610	25.000	Averaged	
Naphthalene	1082	1066	1066	0.100	-1.47071	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	711	711	0.100	-6.90222	25.000	Averaged	

*** = Compound out of QC criteria**

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://katahdinlab.com
sales@katahdinlab.com

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG347010-4
Analytical Date: 12/15/23 13:56
Lab File ID: 2QL10047.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1505	1505	0.100	6.00902	25.000	Averaged	
C9-C12 Aliphatic	1314	1474	1474	0.100	12.15467	25.000	Averaged	
n-Pentane	1375	1407	1407	0.100	2.32149	25.000	Averaged	
2-Methylpentane	1426	1460	1460	0.100	2.35421	25.000	Averaged	
Methyl tert-butylether	1294	1457	1457	0.100	12.60601	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1647	1647	0.100	13.06570	25.000	Averaged	
Benzene	1957	2279	2279	0.100	16.49099	25.000	Averaged	
Toluene	1909	2234	2234	0.100	17.00362	25.000	Averaged	
n-Nonane	1244	1404	1404	0.100	12.84041	30.000	Averaged	
n-Decane	1180	1211	1211	0.100	2.65797	25.000	Averaged	
Ethylbenzene	1757	2129	2129	0.100	21.21421	25.000	Averaged	
m+p-Xylene	1927	2301	2301	0.100	19.40019	25.000	Averaged	
o-Xylene	1935	2334	2334	0.100	20.61814	25.000	Averaged	
1,2,4-trimethylbenzene	1736	2116	2116	0.100	21.86672	25.000	Averaged	
n-Butylcyclohexane	1448	1736	1736	0.100	19.89400	25.000	Averaged	
Naphthalene	1450	1620	1620	0.100	11.78568	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	494	494	0.100	-2.26336	25.000	Averaged	

*** = Compound out of QC criteria**

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Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG347010-5
Analytical Date: 12/16/23 00:25
Lab File ID: 2QL10059.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: A

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C9-C10 Aromatic	936	1040	1040	0.100	11.12937	25.000	Averaged	
Methyl tert-butylether	631	636	636	0.100	0.76032	25.000	Averaged	
Benzene	1171	1195	1195	0.100	2.09210	25.000	Averaged	
Toluene	1036	1090	1090	0.100	5.20740	25.000	Averaged	
Ethylbenzene	909	961	961	0.100	5.66253	25.000	Averaged	
m+p-Xylene	1137	1192	1192	0.100	4.83493	25.000	Averaged	
o-Xylene	961	1038	1038	0.100	8.06735	25.000	Averaged	
1,2,4-trimethylbenzene	936	1040	1040	0.100	11.12937	25.000	Averaged	
Naphthalene	1082	1060	1060	0.100	-1.97541	25.000	Averaged	
2,5-Dibromotoluene (PID)	764	713	713	0.100	-6.68756	25.000	Averaged	

*** = Compound out of QC criteria**

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sales@katahdinlab.com

Form 7
Calibration Verification Summary

Lab Name: Katahdin Analytical Services
SDG: SQ6279
Lab ID: WG347010-5
Analytical Date: 12/16/23 00:25
Lab File ID: 2QL10059.D
Instrument ID: GC02
Initial Calibration Date(s): 09/08/23 11:40 09/08/23 15:06
Column ID: B

Compound	RRF/Amount	RF50	CCAL RRF50	Min RF	%D/ %Drift	Max %D/ %Drift	Curve Type	Qual
C5-C8 Aliphatic	1419	1366	1366	0.100	-3.76582	25.000	Averaged	
C9-C12 Aliphatic	1314	1131	1131	0.100	-13.94913	25.000	Averaged	
n-Pentane	1375	1402	1402	0.100	1.99567	25.000	Averaged	
2-Methylpentane	1426	1286	1286	0.100	-9.81946	25.000	Averaged	
Methyl tert-butylether	1294	1444	1444	0.100	11.55200	25.000	Averaged	
2,2,4-Trimethylpentane	1457	1409	1409	0.100	-3.27796	25.000	Averaged	
Benzene	1957	2205	2205	0.100	12.69075	25.000	Averaged	
Toluene	1909	2153	2153	0.100	12.75361	25.000	Averaged	
n-Nonane	1244	1077	1077	0.100	-13.46041	30.000	Averaged	
n-Decane	1180	881	881	0.100	-25.36370	25.000	Averaged	*
Ethylbenzene	1757	2065	2065	0.100	17.54368	25.000	Averaged	
m+p-Xylene	1927	2241	2241	0.100	16.32459	25.000	Averaged	
o-Xylene	1935	2294	2294	0.100	18.51313	25.000	Averaged	
1,2,4-trimethylbenzene	1736	2102	2102	0.100	21.03736	25.000	Averaged	
n-Butylcyclohexane	1448	1381	1381	0.100	-4.64566	25.000	Averaged	
Naphthalene	1450	1721	1721	0.100	18.70882	25.000	Averaged	
2,5-Dibromotoluene (FID)	505	580	580	0.100	14.68906	25.000	Averaged	

*** = Compound out of QC criteria**

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sales@katahdinlab.com

Form 8
GC Analytical Sequence

Lab Name : Katahdin Analytical Services
SDG : SQ6279
Instrument ID : GC02

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG342400-4	09/08/23	11:40		31.608
Initial Calibration	WG342400-4	09/08/23	11:40	31.597	
Initial Calibration	WG342400-1	09/08/23	12:21		31.591
Initial Calibration	WG342400-1	09/08/23	12:21	31.577	
Initial Calibration	WG342400-2	09/08/23	13:02		31.599
Initial Calibration	WG342400-2	09/08/23	13:02	31.589	
Initial Calibration	WG342400-3	09/08/23	13:43		31.593
Initial Calibration	WG342400-3	09/08/23	13:43	31.583	
Initial Calibration	WG342400-5	09/08/23	14:25		31.599
Initial Calibration	WG342400-5	09/08/23	14:25	31.588	
Initial Calibration	WG342400-6	09/08/23	15:06		31.597
Initial Calibration	WG342400-6	09/08/23	15:06	31.587	
Independent Source	WG342400-7	09/08/23	17:40	31.599	31.612
Continuing Calibrati	WG345505-6	11/15/23	11:50	31.5	31.51
Method Blank	WG345505-1	11/15/23	16:24	31.516	31.526
Laboratory Control S	WG345505-2	11/15/23	17:05	31.499	31.509
Laboratory Control S	WG345505-3	11/15/23	17:46	31.495	31.505
DCL-DUP01-FAL23	SQ6279-1	11/15/23	19:56	31.474	31.485
LFM-03-07-FAL23	SQ6279-2	11/15/23	20:38	31.46	31.47
LFM-99-02B-FAL23	SQ6279-3	11/15/23	21:20	31.451	31.461
Matrix Spike	WG345505-4	11/15/23	22:03	31.456	31.466
Matrix Spike Duplica	WG345505-5	11/15/23	22:45	31.442	31.452
LFM-99-05A-FAL23	SQ6279-4	11/15/23	23:28	31.449	31.459
LFM-99-06A-RP-FAL23	SQ6279-5	11/16/23	00:10	31.445	31.455
Continuing Calibrati	WG345505-7	11/16/23	00:52	31.448	31.458
Continuing Calibrati	WG347010-4	12/15/23	13:56	31.49	31.5
Method Blank	WG347010-1	12/15/23	18:47	31.519	31.53
Laboratory Control S	WG347010-2	12/15/23	20:11	31.448	31.461
Laboratory Control S	WG347010-3	12/15/23	20:54	31.451	31.464
TRIP BLANK	SQ6279-6	12/15/23	21:36	31.451	31.464
Continuing Calibrati	WG347010-5	12/16/23	00:25	31.454	31.46

CHAIN-OF-CUSTODY RECORD

ARVC
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(843) 619-370-0374, jennifer.singer@arcadis.com

COC # DCL_LTM_FAL23

US Army Corps of Engineers

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Long Term Monitoring, DCL,Fall 2023
Project Number: DEVNS-LTM PO 2312 - 00000001	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404	

Comments:
A2320B (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (D) = Ba Cd Cr Cu Fe Pb Mn Se Ag
SW7470A (A) = Mercury
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide
SW9056A (A) = Cl SO4

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter, amber, glass, 1:1 HCl to pH =2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
6	1x 125mL, plastic, Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
21	1x 2-1 Liter, amber, glass, Cool < 6degC
46	1x 250mL, plastic, Cool < 6degC
47	1x 500mL, amber glass, H2SO4; Cool < 6degC
48	1x 250mL plastic, NaOH to pH >12; Cool < 6degC
49	1x 500mL plastic, Cool < 6degC

EPH
VPH
chloride/sulfate
cyanide
metals
Pesticides
Alkalinity
Nitrate
cyanide
TDS

Analytical Test Method

Event: Seres-Arcadis JV, Long Term Monitoring, DCL,Fall 2023

	A2320B (A)	A2540C - TDS	E353.2 (A)	E410.4 - COD	MADEPEP (A)	MADEPVP (A)	SW6010C (D)	SW6020A - As	SW7470A (A)	SW8081B (A)	SW9012B (A)	SW9056A (A)
	46	49	47	6	2	4	9	9	9	21	48	5

	Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs) Top	Depth (ft bgs) Bottom	Cooler	Comments
1	DCL-DUP01-FAL23	WG	11/7/23	1035	FM	LFM-99-05A	FD1	19.00	29.98	1	
2	LFM-03-07-FAL23	WG	11/7/23	1000	AF	LFM-03-07	N1	10.90	20.90	1	
3	LFM-99-02B-FAL23	WG	11/7/23	1215	AF	LFM-99-02B	MS1	14.50	25.83	1	
4	LFM-99-02B-FAL23	WG	11/7/23	1215	AF	LFM-99-02B	N1	14.50	25.83	1	
5	LFM-99-02B-FAL23	WG	11/7/23	1215	AF	LFM-99-02B	SD1	14.50	25.83	1	
6	LFM-99-05A-FAL23	WG	11/7/23	1035	FM	LFM-99-05A	N1	19.00	29.98	1	
7	LFM-99-06A-RP-FAL23	WG	11/7/23	0952	MS	LFM-99-06A-RP	N1	17.50	32.50	1	
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											

680-242830 Chain of Custody

Turnaround Time: NA

Relinquished by: (Signature) Fu
Date
Time
Received by: (Signature)

Received by Laboratory: (Signature) TM
Date 11-10-23
Time 1006

2.2/25 4.4/4.7 0.4/0.7 1.4/2.2

1/5/2024

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756059.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242830-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 11/27/2023			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM DCL, Fall 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	410.4/ COD	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DCL-DUP01-FAL23 (680-242830-1)	11/7/23	10:35 Eastern		Water			X	1	
LFM-03-07-FAL23 (680-242830-2)	11/7/23	10:00 Eastern		Water			X	1	
LFM-99-02B-FAL23 (680-242830-3)	11/7/23	12:15 Eastern		Water			X	1	
LFM-99-02B-FAL23 (680-242830-3MS)	11/7/23	12:15 Eastern	MS	Water			X	1	
LFM-99-02B-FAL23 (680-242830-3MSD)	11/7/23	12:15 Eastern	MSD	Water			X	1	
LFM-99-05A-FAL23 (680-242830-4)	11/7/23	10:35 Eastern		Water			X	1	
LFM-99-06A-RP-FAL23 (680-242830-5)	11/7/23	08:52 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
TH	11-15-23			11/14/23 945	EET DEN
Relinquished by:	Date/Time: 14:08	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2 Corr +.3

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-756064.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Jerry.Lanier@et.eurofinsus.com	State of Origin: Massachusetts	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-242830-1
Address: 2425 New Holland Pike,	Due Date Requested: 11/27/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Seres-Arcadis JV, LTM DCL, Fall 2023	Project #: 68023801			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	MAEPH_DOD/3510C_14d MA EPH DOD	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DCL-DUP01-FAL23 (680-242830-1)	11/7/23	10:35 Eastern		Water			X	2	
LFM-03-07-FAL23 (680-242830-2)	11/7/23	10:00 Eastern		Water			X	2	
LFM-99-02B-FAL23 (680-242830-3)	11/7/23	12:15 Eastern		Water			X	2	
LFM-99-02B-FAL23 (680-242830-3MS)	11/7/23	12:15 Eastern	MS	Water			X	2	
LFM-99-02B-FAL23 (680-242830-3MSD)	11/7/23	12:15 Eastern	MSD	Water			X	2	
LFM-99-05A-FAL23 (680-242830-4)	11/7/23	10:35 Eastern		Water			X	2	
LFM-99-06A-RP-FAL23 (680-242830-5)	11/7/23	08:52 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
TH	11:00				
Relinquished by	Date/Time 11-13-23	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time 11/14/23 9:50	Company EUET

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.6/2.1 2.3/2.1

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242830-1

Login Number: 242830
List Number: 1
Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242830-1

Login Number: 242830
List Number: 3
Creator: Little, Matthew L

List Source: Eurofins Denver
List Creation: 11/14/23 01:06 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-242830-1

Login Number: 242830
List Number: 2
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/14/23 02:26 PM

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Appendix C

Summary of Quality Control Exceedances and Data Validation Reports

The following laboratory QC exceedances were noted during data validation:

- AOC 32/43A/spring 2023:
  - Samples 32M-01-17XBR-SPR23 and 32M-RB-01-SPR23 were analyzed outside of the technical holding time for VOC analysis. The results for all reported VOCs in these samples were not detected and were qualified as estimated (UJ). The results may be biased low.
  - Headspace was noted in the sample containers associated with the MassDEP VPH analysis of samples 32M-01-17XBR-SPR23, 32M-RB-01-SPR23, and 32M-01-14XOB-SPR23. The results for all reported compounds in these samples were not detected and were qualified as estimated (UJ). The results may be biased low.
  - The initial calibration verification (ICV) associated with VOC analysis exhibited results for trichlorofluoromethane less than the acceptance criteria. The non-detect results for trichlorofluoromethane in samples 32M-01-17XBR-SPR23 and 32M-RB-01-SPR23 were qualified as estimated (UJ).
  - The continuing calibration verification (CCV) associated with VOC analysis exhibited result for carbon tetrachloride less than the acceptance criteria. In addition, vinyl acetate exhibited a result less than the acceptance criteria in the closing CCV. The non-detect results for carbon tetrachloride and vinyl acetate in samples 32M-01-17XBR-SPR23 and 32M-RB-01-SPR23 were qualified as estimated (UJ).
  - The CCV associated with VOC analysis exhibited result for bromoform less than the acceptance criteria. In addition, vinyl acetate exhibited a result less than the acceptance criteria in the ICV and closing CCV. The non-detect results for bromoform and vinyl acetate in samples 32M-01-14XOB-SPR23, 32M-01-18XBR-SPR23, 32M-DUP01-SPR23, and 32M-TB-01-SPR23 were qualified as estimated (UJ).
  - Recovery of the VOC surrogate compounds dibromofluoromethane and toluene-d8 were greater than the control limit in field duplicate sample 32M-DUP01-SPR23. The results for the detected analytes reported in sample 32M-DUP01-SPR23 were qualified as estimated (J) with a potential for high bias in the reported results.
  - The recoveries of benzene, ethylbenzene, m,p-xylene, methyl tert-butyl ether, naphthalene, o-xylene, toluene, C9-C10 volatile petroleum hydrocarbons aromatic were less than the control limits in the matrix spike (MS) and/or matrix spike duplicate (MSD) associated with the MassDEP VPH analysis performed using sample 32M-01-17XBR-SPR23. The non-detect results for benzene, ethylbenzene, m,p-xylene, methyl tert-butyl ether, naphthalene, o-xylene, toluene, C9-C10 volatile petroleum hydrocarbons aromatic in this sample were qualified as estimated (UJ) with a potential for low bias in the reported results.
- AOC 57/spring 2023:
  - The MS/MSD performed using sample 57M-95-03X-SPR23 exhibited an MSD recovery for arsenic greater than the acceptance criteria. The arsenic result in sample 57M-95-03X-SPR23 was qualified as estimated (J) with a potential for high bias in the reported result.
- DCL/spring 2023:

- Samples LFM-03-07-SPR23, LFM-99-02B-SPR23, LFM-99-05A-SPR23, and LFM-99-06A-RP-SPR23, and field duplicate sample LFM-DUP01-SPR23 were extracted past the technical holding time for MassDEP EPH. The results for all reported compounds in these samples were qualified as estimated (UJ/J). The results may be biased low.
- The CCV associated with pesticide analysis exhibited results for endosulfan sulfate, endrin, p,p'-DDD, p,p'-DDE, and p,p'-DDT less than the acceptance criteria. The non-detect results for the listed compounds in sample LFM-99-02B-SPR23 were qualified as estimated (UJ).
- The MS/MSD performed using sample LFM-99-02B-SPR23 in association with the MassDEP EPH analysis exhibited a relative percent difference (RPD) between the MS and MSD recoveries greater than the acceptance criteria for phenanthrene. The phenanthrene result in sample LFM-99-02B-SPR23 was qualified as estimated (J).
- Recoveries of C9-C18 petroleum hydrocarbons aliphatic, 2-methylnaphthalene, and naphthalene were less than the control limit in the laboratory control sample (LCS) analyzed in association with the MassDEP EPH analysis of samples LFM-03-07-SPR23, LFM-99-02B-SPR23, LFM-99-05A-SPR23, and LFM-99-06A-RP-SPR23, and field duplicate sample LFM-DUP01-SPR23. The associated non-detect results were qualified as estimated (UJ) with a potential for low bias in the reported results.
- Recoveries of the pesticides aldrin, alpha-BHC, alpha-endosulfan, beta-endosulfan, dieldrin, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, gamma-BHC, heptachlor, heptachlor epoxide, p,p'-DDE, and p,p'-DDE were less than the control limit in the LCS analyzed in association with the analysis of samples LFM-03-07-SPR23, LFM-99-02B-SPR23, LFM-99-05A-SPR23, and LFM-99-06A-RP-SPR23, and field duplicate sample LFM-DUP01-SPR23. The associated non-detect results were qualified as estimated (UJ) with a potential for low bias in the reported results.
- C11-C22 petroleum hydrocarbons aromatic fraction was detected in the MassDEP EPH laboratory method blank. The C11-C22 petroleum hydrocarbons aromatic fraction result in sample LFM-99-02B-SPR23 was qualified as not detected (U).

- DCL/fall 2023:

- Sample DCL LEACHATE-FAL23 was analyzed outside of the technical holding time for VOC analysis. The results for all reported VOCs in this sample were not detected and were qualified as estimated (UJ). The results may be biased low.
- Sample DCL LEACHATE-FAL23 was extracted outside of the technical holding time for SVOC analysis. The results for all reported SVOCs in this sample were not detected and were qualified as estimated (UJ). The results may be biased low.
- Sample TRIP BLANK was analyzed outside of the technical holding time for MassDEP VPH analysis. The results for all reported compounds in this sample were not detected and were qualified as rejected (R) since the analysis was performed greater than 2-times outside of the analytical holding time.
- The difference in the alkalinity results between the parent sample LFM-99-05A-FAL23 and field duplicate sample DCL-DUP01-FAL23 was greater than the acceptance limit. The alkalinity results in these samples were qualified as estimated (J).
- The ICV associated with pesticide analysis exhibited recoveries of alpha-endosulfan and p,p'-DDE less than the acceptance criteria and CCV exhibited results for dieldrin, endosulfan sulfate, endrin ketone, and p,p'-DDE less than the acceptance criteria. The results for the listed compounds in sample DCL LEACHATE-FAL23 were qualified as estimated (UJ/J) with a potential for low bias in the reported results.
- The CCV associated with PCB analysis exhibited recoveries of PCB-1221 and PCB-1254 less than the acceptance criteria. The results for the listed compounds in sample DCL LEACHATE-FAL23 were qualified as estimated (UJ) with a potential for low bias in the reported results.
- The CCV associated with pesticide analysis exhibited results for dieldrin, endosulfan sulfate, endrin ketone, and p,p'-DDE less than the acceptance criteria. The results for the listed compounds in samples DCL-DUP01-FAL23, LFM-03-07-FAL23, LFM-99-02B-FAL23, LFM-99-05A-FAL23, and LFM-99-06A-RP-FAL23 were qualified as estimated (UJ/J) with a potential for low bias in the reported results.
- The CCV associated with SVOC analysis exhibited result for 3,3-dichlorobenzidine less than the acceptance criteria. The 3,3-dichlorobenzidine result for in sample DCL-LEACHATE-FAL23 was qualified as estimated (UJ) with a potential for low bias in the reported results.
- Recovery of the SVOC surrogate compound phenol-d5 was less than the control limit in sample DCL LEACHATE-FAL23. The results for the acid fraction analytes reported in sample DCL LEACHATE-FAL23 were qualified as estimated (UJ) with a potential for low bias in the reported results.
- Recovery of the TPH surrogate compound o-terphenyl was less than the control limit in sample DCL LEACHATE-FAL23. The result for C10-C28 petroleum hydrocarbons in sample DCL LEACHATE-FAL23 was qualified as estimated (J) with a potential for low bias in the reported results.
- The recoveries of the pesticides alpha-endosulfan, endrin, p,p'DDD, and p,p'-DDT were less than the lower control limits in the MS and MSD performed using sample LFM-99-02B-FAL23. In addition, the RPD between the MS and MSD results was greater than the acceptance limits for

endrin ketone. The results for the listed compounds in this sample was qualified as estimated (UJ/J).

- The recoveries of nitrate-nitrite as N were less than 30% in the MS and MSD performed using sample LFM-99-02B-FAL23. In addition, the RPD between the MS and MSD results was greater than the acceptance The non-detect result for nitrate-nitrite as N in this sample was qualified as rejected (R) since the recoveries were less than 30%.
- C19-C36 petroleum hydrocarbons aliphatic fraction was detected in the MassDEP EPH laboratory method blank. The C19-C36 petroleum hydrocarbons aliphatic fraction result in sample LFM-03-07-FAL23 was qualified as not detected (U) at the limit of quantitation.

- AOC 43G/fall 2023:
  - No laboratory QC exceedances were noted.
- AOC 69W/fall 2023:
  - The MS/MSD performed using sample ZWM-95-18X-FAL23 exhibited an MS recovery for dissolved manganese less than the acceptance criteria. The dissolved manganese result in sample ZWM-95-18X-FAL23 was qualified as estimated (J) with a potential for low bias in the reported result.
  - C11-C22 petroleum hydrocarbons aromatic, C19-C36 petroleum hydrocarbons aliphatic, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, and phenanthrene exhibited RPD between the LCS and LCSD results greater than the acceptance criteria in association with the MassDEP EPH analysis of samples 69W-94-13-FAL23, 69W-94-14-FAL23, ZWM-01-25X-FAL23, ZWM-95-15X-FAL23, ZMW-99-22X-FAL23, ZWM-99-23X-FAL23, and ZWM-99-24X-FAL23. The detected results for the listed compounds in samples 69W-94-13-FAL23 (C11-C22 petroleum hydrocarbons aromatic), 69W-94-14-FAL23 (C19-C36 petroleum hydrocarbons aliphatic), ZWM-01-25X-FAL23 (C19-C36 petroleum hydrocarbons aliphatic), ZWM-95-15X-FAL23 (C11-C22 petroleum hydrocarbons aromatic and C19-C36 petroleum hydrocarbons aliphatic), ZMW-99-22X-FAL23 (2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, C11-C22 petroleum hydrocarbons aromatic, fluorene, and phenanthrene), ZWM-99-23X-FAL23 (C11-C22 petroleum hydrocarbons aromatic and C19-C36 petroleum hydrocarbons aliphatic), and ZWM-99-24X-FAL23 (C19-C36 petroleum hydrocarbons aliphatic) were qualified as estimated (J).
  - Dissolved iron was detected in the laboratory continuing calibration blank. The dissolved iron result in sample 69W-94-14-FAL23 was qualified as not detected (U) at the limit of quantitation.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 28, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on July 26, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57156_C:

SDG #	**Fraction**
680-236086-2	Volatiles, Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

547 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		As,Mn (6010C /6020A)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH		EPH (MADEP -EPH		Methane Ethane Ethene																	
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	8	0	-	-	-	-	-	-	7	0	-	-	-	-	6	0																
B	680-236086-1	07/26/23	08/09/23	5	0	-	-	-	-	-	-	4	0	-	-	-	-	3	0																
C	680-236086-2	07/26/23	08/09/23	2	0	-	-	-	-	2	0	-	-	2	0	-	-	-	-																
D	680-236120-1	07/26/23	08/09/23	-	-	5	0	5	0	-	-	-	-	5	0	10	0	-	-																
E	680-236128-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
F	680-236128-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	4	0	-	-	-	-	-	-																
G	680-236128-3	07/26/23	08/09/23	6	0	-	-	-	-	4	0	-	-	4	0	-	-	-	-																
H	680-236378-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	14	0	-	-	-	-	-	-																
I	680-236434-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	18	0	-	-	-	-	-	-																
J	680-236498-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	2	0	-	-	-	-	-	-																
K	680-236498-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	26	0	-	-	-	-	-	-																
L	680-236818-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
M	680-237047-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-																
Total	TR/PG			24	0	5	0	5	0	6	0	86	0	11	0	10	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO_3 /NO_2-N (353.2)		SO_4 (9056A)		S= (9034)		TDS (2540C)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	6	0	-	-	-	-	-	-	-	-	6	0	6	0	6	0	-	-	6	0												
B	680-236086-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	-	-	3	0	3	0	3	0	-	-	3	0												
D	680-236120-1	07/26/23	08/09/23	5	0	5	0	5	0	5	0	-	-	5	0	5	0	-	-	5	0	-	-												
E	680-236128-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
H	680-236378-1	07/26/23	08/09/23	14	0	-	-	-	-	14	0	14	0	-	-	14	0	-	-	-	-	-	-												
I	680-236434-1	07/26/23	08/09/23	18	0	-	-	-	-	18	0	18	0	-	-	18	0	-	-	-	-	-	-												
K	680-236498-2	07/26/23	08/09/23	25	0	-	-	-	-	25	0	25	0	-	-	25	0	-	-	-	-	-	-												
L	680-236818-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
M	680-237047-1	07/26/23	08/09/23	1	0	-	-	-	-	1	0	1	0	-	-	1	0	-	-	-	-	-	-												
Total	TR/PG			82	0	5	0	5	0	73	0	68	0	14	0	82	0	9	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0	0	352

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-236086-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
SDG:	680-236086-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Allie Jefferson, Chemist/ERPIMS Specialist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	August 24, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP	SW6010C	SW6020A	SW8260D
32M-01-17XBR-SPR23	680-236086-5	Water	Field Sample/N	X	X	X	X
32M-RB-01-SPR23	680-236086-6	Water	Equipment Blank/EB	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA and were reported under sample delivery group (SDG) 680-236086-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Equipment Blank
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 156 results (97.50%) out of the 160 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPVP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW8260D	No additional comments; see Checklist for detail.

August 24, 2023

Reviewed by Allie Jefferson, Chemist/ERPIMS Specialist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

August 28, 2023

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method MADEPVP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-17XBR-SPR23 (MS)	Benzene	46.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	Benzene	52.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	62.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	Ethylbenzene	46.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	Ethylbenzene	53.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	m,p-Xylene	47.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	m,p-Xylene	53.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	Methyl tert-butyl ether (MTBE)	41.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	Methyl tert-butyl ether (MTBE)	48.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	Naphthalene	45.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	Naphthalene	51.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	o-Xylene	46.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	o-Xylene	52.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (MS)	Toluene	46.0	70 - 130	10 - 130	percent	J/UJ	M	
32M-01-17XBR-SPR23 (SD)	Toluene	52.0	70 - 130	10 - 130	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Benzene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U J1	20.0 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Ethylbenzene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	m,p-Xylene	10.0	5.00 U J1	5.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Naphthalene	6.00	4.00 U J1	4.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	o-Xylene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P

Qualified Results associated with the MS Recovery for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Toluene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8260D, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS6807851623 (CV)	Carbon Tetrachloride	76.0	80 - 120	80 - 120	percent	J/X	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2
32M-RB-01-SPR23 680-236086-6	EB	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8260D, Ending Continuing Calibration Verification

Compliance requirements for satisfactory closing continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVC68078516231 (EV)	Chloroethane	173	50 - 150	50 - 150	percent	J/None	V5	
CCVC68078516231 (EV)	Trichlorofluoromethane	218	50 - 150	50 - 150	percent	J/None	V5	
CCVC68078516231 (EV)	Vinyl acetate	45.0	50 - 150	50 - 150	percent	J/X	V5	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Ending Continuing Calibration Verification for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5
32M-RB-01-SPR23 680-236086-6	EB	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8260D, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6807847703 (BS)	Trichlorofluoromethane	154	65 - 141	10 - 141	percent	J/None	C	
LCSD6807847704 (BD)	1,2,3-Trichlorobenzene	154	69 - 129	10 - 129	percent	J/None	C	
LCSD6807847704 (BD)	1,2,4-Trichlorobenzene	154	69 - 130	10 - 130	percent	J/None	C	
LCSD6807847704 (BD)	Naphthalene	147	61 - 128	10 - 128	percent	J/None	C	
LCSD6807847704 (BD)	Trichlorofluoromethane	156	65 - 141	10 - 141	percent	J/None	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, LCS RPD

The objective of laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. LCS/LCSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Laboratory control sample/laboratory control sample duplicate RPD results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCSD6807847704 (BD)	1,2,3-Trichlorobenzene	21.7	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	1,2,4-Trichlorobenzene	25.4	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	2-Chlorotoluene	24.1	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	4-Chlorotoluene	22.1	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	Cumene	30.8	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	Naphthalene	25.5	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	n-Propylbenzene	26.1	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	sec-Butylbenzene	22.1	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	Styrene	22.3	< 20	< 20	rpd	J/None	Z	
LCSD6807847704 (BD)	tert-Butylbenzene	25.1	< 20	< 20	rpd	J/None	Z	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-17XBR-SPR23 (MS)	Chloroethane	206	60 - 138	10 - 138	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	Chloroethane	202	60 - 138	10 - 138	percent	J/None	M	
32M-01-17XBR-SPR23 (MS)	Ethylbenzene	127	79 - 121	10 - 121	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	Ethylbenzene	125	79 - 121	10 - 121	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	m,p-Xylene	124	80 - 121	10 - 121	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	o-Xylene	123	78 - 122	10 - 122	percent	J/None	M	
32M-01-17XBR-SPR23 (MS)	Trichlorofluoromethane	168	65 - 141	10 - 141	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	Trichlorofluoromethane	167	65 - 141	10 - 141	percent	J/None	M	
32M-01-17XBR-SPR23 (SD)	Xylenes, Total	124	79 - 121	10 - 121	percent	J/None	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-17XBR-SPR23 (SD)	1,2-Dichloroethane-d4	120	81 - 118	10 - 118	percent	J/None	I	No Qualifiers Applied
32M-01-17XBR-SPR23 (MS)	1-Bromo-4-fluorobenzene (4-Bromofluorobenzene)	124	85 - 114	10 - 114	percent	J/None	I	No Qualifiers Applied
32M-01-17XBR-SPR23 (SD)	1-Bromo-4-fluorobenzene (4-Bromofluorobenzene)	128	85 - 114	10 - 114	percent	J/None	I	No Qualifiers Applied

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, Test Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of analysis found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-17XBR-SPR23 (N)		16.1	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL
32M-RB-01-SPR23 (EB)		16.0	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	1,1,1,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,2,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,2-Trichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,3-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,3-Trichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,4-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,4-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dibromo-3-chloropropane	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dibromoethane (EDB)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloropropane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,3,5-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,3-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	1,3-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,4-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2,2-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Butanone (MEK)	25.0	20.0 U H	20.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Chlorotoluene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Hexanone	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	4-Chlorotoluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	4-Methyl-2-pentanone (MIBK)	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Acetone	25.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Benzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromodichloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromoform	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromomethane	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Carbon disulfide	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2
32M-01-17XBR-SPR23 680-236086-5	N	Chlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloroethane	20.0	10.0 U H Q	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloroform	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloromethane	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	cis-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	cis-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Cumene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dibromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dibromomethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dichlorodifluoromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Ethylbenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Hexachlorobutadiene	5.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	m,p-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Methylene chloride	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Naphthalene	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	n-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	n-Propylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	o-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	p-Cymene (p-Isopropyltoluene)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	sec-Butylbenzene	2.50	2.00 U M H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Styrene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	tert-Butylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Tetrachloroethene (PCE)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Toluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	trans-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	trans-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Trichloroethene (TCE)	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V1
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Xylenes, Total	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,1,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,2,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,2-Trichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,3-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,3-Trichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,4-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,4-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dibromo-3-chloropropane	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dibromoethane (EDB)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloropropane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3,5-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,4-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2,2-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Butanone (MEK)	25.0	20.0 U H	20.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Chlorotoluene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Hexanone	20.0	10.0 U M H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	4-Chlorotoluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	4-Methyl-2-pentanone (MIBK)	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Acetone	25.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Benzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromodichloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	Bromoform	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromomethane	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Carbon disulfide	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2
32M-RB-01-SPR23 680-236086-6	EB	Chlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloroethane	20.0	10.0 U H Q	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloroform	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloromethane	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	cis-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	cis-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Cumene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dibromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dibromomethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dichlorodifluoromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Ethylbenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Hexachlorobutadiene	5.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	m,p-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Methyl tert-butyl ether (MTBE)	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Methylene chloride	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Naphthalene	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	n-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	n-Propylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	o-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	p-Cymene (p-Isopropyltoluene)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	sec-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Styrene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	tert-Butylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	Tetrachloroethene (PCE)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Toluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	trans-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	trans-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Trichloroethene (TCE)	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V1
32M-RB-01-SPR23 680-236086-6	EB	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5
32M-RB-01-SPR23 680-236086-6	EB	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Xylenes, Total	2.00	1.00 U H	1.00 UJ		ug/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: MADEPVP		**Extraction Method: SW5030C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Benzene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-01-17XBR-SPR23 680-236086-5	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U J1	20.0 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-01-17XBR-SPR23 680-236086-5	N	Ethylbenzene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	m,p-Xylene	10.0	5.00 U J1	5.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Naphthalene	6.00	4.00 U J1	4.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	o-Xylene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Toluene	5.00	2.00 U J1	2.00 UJ		ug/l	M/P
32M-RB-01-SPR23 680-236086-6	EB	Benzene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U	20.0 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	Ethylbenzene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	m,p-Xylene	10.0	5.00 U	5.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	Methyl tert-butyl ether (MTBE)	5.00	2.00 U	2.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	Naphthalene	6.00	4.00 U	4.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	o-Xylene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-RB-01-SPR23 680-236086-6	EB	Toluene	5.00	2.00 U	2.00 UJ		ug/l	P

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	1,1,1,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,2,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1,2-Trichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,1-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,3-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,3-Trichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,4-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2,4-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dibromo-3-chloropropane	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dibromoethane (EDB)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,2-Dichloropropane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,3,5-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,3-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,3-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	1,4-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2,2-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Butanone (MEK)	25.0	20.0 U H	20.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Chlorotoluene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	2-Hexanone	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	4-Chlorotoluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	4-Methyl-2-pentanone (MIBK)	20.0	10.0 U H	10.0 UJ		ug/l	H1

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Acetone	25.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Benzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromodichloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromoform	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Bromomethane	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Carbon disulfide	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2
32M-01-17XBR-SPR23 680-236086-5	N	Chlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloroethane	20.0	10.0 U H Q	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloroform	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Chloromethane	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	cis-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	cis-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Cumene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dibromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dibromomethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Dichlorodifluoromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Ethylbenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Hexachlorobutadiene	5.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	m,p-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Methylene chloride	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Naphthalene	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	n-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	n-Propylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR23 680-236086-5	N	o-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	p-Cymene (p-Isopropyltoluene)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	sec-Butylbenzene	2.50	2.00 U M H	2.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Styrene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	tert-Butylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Tetrachloroethene (PCE)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Toluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	trans-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	trans-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Trichloroethene (TCE)	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V1
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-01-17XBR-SPR23 680-236086-5	N	Xylenes, Total	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,1,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,2,2-Tetrachloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1,2-Trichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,1-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,3-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,3-Trichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,4-Trichlorobenzene	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2,4-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dibromo-3-chloropropane	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dibromoethane (EDB)	2.00	1.00 U H	1.00 UJ		ug/l	H1

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloroethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,2-Dichloropropane	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3,5-Trimethylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,3-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	1,4-Dichlorobenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2,2-Dichloropropane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Butanone (MEK)	25.0	20.0 U H	20.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Chlorotoluene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	2-Hexanone	20.0	10.0 U M H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	4-Chlorotoluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	4-Methyl-2-pentanone (MIBK)	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Acetone	25.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Benzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromodichloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromoform	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Bromomethane	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Carbon disulfide	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V2
32M-RB-01-SPR23 680-236086-6	EB	Chlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloroethane	20.0	10.0 U H Q	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloroform	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Chloromethane	2.50	2.00 U H	2.00 UJ		ug/l	H1

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	cis-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	cis-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Cumene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dibromochloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dibromomethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Dichlorodifluoromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Ethylbenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Hexachlorobutadiene	5.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	m,p-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Methyl tert-butyl ether (MTBE)	5.00	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Methylene chloride	20.0	10.0 U H	10.0 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Naphthalene	10.0	5.00 U H	5.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	n-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	n-Propylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	o-Xylene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	p-Cymene (p-Isopropyltoluene)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	sec-Butylbenzene	2.50	2.00 U H	2.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Styrene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	tert-Butylbenzene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Tetrachloroethene (PCE)	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Toluene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	trans-1,2-Dichloroethene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	trans-1,3-Dichloropropene	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Trichloroethene (TCE)	1.00	0.500 U H	0.500 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ		ug/l	H1/V1

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-RB-01-SPR23 680-236086-6	EB	Vinyl acetate	2.50	2.00 U H Q	2.00 UJ		ug/l	H1/V5
32M-RB-01-SPR23 680-236086-6	EB	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
32M-RB-01-SPR23 680-236086-6	EB	Xylenes, Total	2.00	1.00 U H	1.00 UJ		ug/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPVP

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Benzene	5.00	2.00 U J1	2.00 UJ	2.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-01-17XBR-SPR23 680-236086-5	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U J1	20.0 UJ	20.0 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-01-17XBR-SPR23 680-236086-5	N	Ethylbenzene	5.00	2.00 U J1	2.00 UJ	2.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	m,p-Xylene	10.0	5.00 U J1	5.00 UJ	5.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U J1	2.00 UJ	2.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Naphthalene	6.00	4.00 U J1	4.00 UJ	4.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	o-Xylene	5.00	2.00 U J1	2.00 UJ	2.00 UJ	M/P
32M-01-17XBR-SPR23 680-236086-5	N	Toluene	5.00	2.00 U J1	2.00 UJ	2.00 UJ	M/P
32M-RB-01-SPR23 680-236086-6	EB	Benzene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U	20.0 U	20.0 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	Ethylbenzene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	m,p-Xylene	10.0	5.00 U	5.00 U	5.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	Methyl tert-butyl ether (MTBE)	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	Naphthalene	6.00	4.00 U	4.00 U	4.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	o-Xylene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-RB-01-SPR23 680-236086-6	EB	Toluene	5.00	2.00 U	2.00 U	2.00 UJ	P

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
32M-01-17XBR-SPR23 680-236086-5	N	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 X	1.00 UJ	H1/V2
32M-01-17XBR-SPR23 680-236086-5	N	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ	1.00 UJ	H1/V1
32M-01-17XBR-SPR23 680-236086-5	N	Vinyl acetate	2.50	2.00 U H Q	2.00 X	2.00 UJ	H1/V5
32M-RB-01-SPR23 680-236086-6	EB	Carbon Tetrachloride	2.00	1.00 U H Q	1.00 X	1.00 UJ	H1/V2
32M-RB-01-SPR23 680-236086-6	EB	Trichlorofluoromethane	2.00	1.00 U H Q	1.00 UJ	1.00 UJ	H1/V1
32M-RB-01-SPR23 680-236086-6	EB	Vinyl acetate	2.50	2.00 U H Q	2.00 X	2.00 UJ	H1/V5

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
C	LCS Recovery
H1	Test Hold Time
I	Surrogate recovery outside project limits.
M	MS Recovery
P	Sample preservation/collection requirement not met.
TR	Trace Level Detect
V1	ICV
V2	CCV
V5	Ending Continuing Calibration Verification
Z	LCS RPD

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low

+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?		•		Headspace was present in vials. All results were qualified J/UJ.
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Results qualified UJ due to MS/MSD %R below limits.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW8260D (Volatile Organic Compounds by GC/MS)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Test holding time exceeds UWL. Results qualified J/UJ.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		CCV and closing CCV %D exceeds the limit for for several compounds. All affected results were non-detect and qualified UJ.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?		•		ICV %D exceeds the limit for one compound. Data was qualified.
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		Out high. No detects, no data qualified.
Was the LCS/LCSD RPD within project acceptance limits?		•		RPD out. Results ND, no data qualified.
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Out high. No detect, no data qualified.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 28, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on July 26, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57156_G:

SDG #	**Fraction**
680-236128-3	Volatiles, Metals, Volatile Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

547 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		As,Mn (6010C /6020A)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH		EPH (MADEP -EPH		Methane Ethane Ethene																	
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	8	0	-	-	-	-	-	-	7	0	-	-	-	-	6	0																
B	680-236086-1	07/26/23	08/09/23	5	0	-	-	-	-	-	-	4	0	-	-	-	-	3	0																
C	680-236086-2	07/26/23	08/09/23	2	0	-	-	-	-	2	0	-	-	2	0	-	-	-	-																
D	680-236120-1	07/26/23	08/09/23	-	-	5	0	5	0	-	-	-	-	5	0	10	0	-	-																
E	680-236128-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
F	680-236128-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	4	0	-	-	-	-	-	-																
G	680-236128-3	07/26/23	08/09/23	6	0	-	-	-	-	4	0	-	-	4	0	-	-	-	-																
H	680-236378-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	14	0	-	-	-	-	-	-																
I	680-236434-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	18	0	-	-	-	-	-	-																
J	680-236498-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	2	0	-	-	-	-	-	-																
K	680-236498-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	26	0	-	-	-	-	-	-																
L	680-236818-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
M	680-237047-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-																
Total	TR/PG			24	0	5	0	5	0	6	0	86	0	11	0	10	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO_3 /NO_2-N (353.2)		SO_4 (9056A)		S= (9034)		TDS (2540C)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	6	0	-	-	-	-	-	-	-	-	6	0	6	0	6	0	-	-	6	0												
B	680-236086-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	-	-	3	0	3	0	3	0	-	-	3	0												
D	680-236120-1	07/26/23	08/09/23	5	0	5	0	5	0	5	0	-	-	5	0	5	0	-	-	5	0	-	-												
E	680-236128-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
H	680-236378-1	07/26/23	08/09/23	14	0	-	-	-	-	14	0	14	0	-	-	14	0	-	-	-	-	-	-												
I	680-236434-1	07/26/23	08/09/23	18	0	-	-	-	-	18	0	18	0	-	-	18	0	-	-	-	-	-	-												
K	680-236498-2	07/26/23	08/09/23	25	0	-	-	-	-	25	0	25	0	-	-	25	0	-	-	-	-	-	-												
L	680-236818-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
M	680-237047-1	07/26/23	08/09/23	1	0	-	-	-	-	1	0	1	0	-	-	1	0	-	-	-	-	-	-												
Total	TR/PG			82	0	5	0	5	0	73	0	68	0	14	0	82	0	9	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0	0	352

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-236128-3

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
SDG:	680-236128-3
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Allie Jefferson, Chemist/ERPIMS Specialist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	August 24, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP	SW6010C	SW6020A	SW8260D
32M-01-13XBR-SPR23	680-236128-10	Water	Field Sample/N	X	X	X	X
32M-01-14XOB-SPR23	680-236128-11	Water	Field Sample/N	X	X	X	X
32M-01-18XBR-SPR23	680-236128-12	Water	Field Sample/N	X	X	X	X
32M-DUP01-SPR23	680-236128-13	Water	Field Duplicate/FD	X	X	X	X
32M-TB-01-SPR23	680-236128-14	Water	Trip Blank/TB				X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA and were reported under sample delivery group (SDG) 680-236128-3. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 20 results (5.15%) out of the 388 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPVP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW8260D	Reanalysis results were determined not reportable. Initial results were more usable.

August 24, 2023

Reviewed by Allie Jefferson, Chemist/ERPIMS Specialist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

August 28, 2023

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW8260D, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS6807849263 (CV)	1,3-Dichloropropane	122	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	2-Hexanone	122	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Bromomethane	127	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Chloroethane	139	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Chloromethane	148	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Dichlorodifluoromethane	162	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Trichlorofluoromethane	139	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807849263 (CV)	Vinyl chloride	166	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807852354 (CV)	Bromoform	79.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6807852354 (CV)	Vinyl acetate	340	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR23 680-236128-12	N	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-DUP01-SPR23 680-236128-13	FD	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-TB-01-SPR23 680-236128-14	TB	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8260D, Ending Continuing Calibration Verification

Compliance requirements for satisfactory closing continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVC68078492631 (EV)	Dichlorodifluoromethane	162	50 - 150	50 - 150	percent	J/None	V5	
CCVC68078523534 (EV)	Bromomethane	151	50 - 150	50 - 150	percent	J/None	V5	
CCVC68078523534 (EV)	Vinyl acetate	36.0	50 - 150	50 - 150	percent	J/X	V5	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Ending Continuing Calibration Verification for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-01-18XBR-SPR23 680-236128-12	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-DUP01-SPR23 680-236128-13	FD	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-TB-01-SPR23 680-236128-14	TB	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8260D, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB6807849268 (LB)	1,2,4-Trichlorobenzene	0.934	< 0.53	< 5	ug/l	U/None*	L	
MB6807849268 (LB)	Hexachlorobutadiene	0.659	< 0.22	< 5	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6807849264 (BS)	1,3-Dichloropropane	120	80 - 119	10 - 119	percent	J/None	C	
LCS6807849264 (BS)	Chloromethane	143	50 - 139	10 - 139	percent	J/None	C	
LCS6807849264 (BS)	Dichlorodifluoromethane	162	32 - 152	10 - 152	percent	J/None	C	
LCS6807849264 (BS)	Vinyl chloride	161	58 - 137	10 - 137	percent	J/None	C	
LCS6807852355 (BS)	Vinyl acetate	337	54 - 146	10 - 146	percent	J/None	C	
LCSD6807849265 (BD)	1,3-Dichloropropane	121	80 - 119	10 - 119	percent	J/None	C	
LCSD6807849265 (BD)	Chloroethane	142	60 - 138	10 - 138	percent	J/None	C	
LCSD6807849265 (BD)	Chloromethane	148	50 - 139	10 - 139	percent	J/None	C	
LCSD6807849265 (BD)	Dichlorodifluoromethane	166	32 - 152	10 - 152	percent	J/None	C	
LCSD6807849265 (BD)	Vinyl chloride	170	58 - 137	10 - 137	percent	J/None	C	
LCSD6807852356 (BD)	Vinyl acetate	337	54 - 146	10 - 146	percent	J/None	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8260D, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-14XOB-SPR23 (N)	Dibromofluoromethane	123	89 - 119	10 - 119	percent	J/None	I	
32M-01-14XOB-SPR23 (N)	Toluene-d8	115	89 - 112	10 - 112	percent	J/None	I	
32M-01-18XBR-SPR23 (N)	Dibromofluoromethane	128	89 - 119	10 - 119	percent	J/None	I	
32M-01-18XBR-SPR23 (N)	Toluene-d8	119	89 - 112	10 - 112	percent	J/None	I	
32M-DUP01-SPR23 (FD)	Dibromofluoromethane	124	89 - 119	10 - 119	percent	J/None	I	
32M-DUP01-SPR23 (FD)	Toluene-d8	115	89 - 112	10 - 112	percent	J/None	I	
32M-TB-01-SPR23 (TB)	Toluene-d8	114	89 - 112	10 - 112	percent	J/None	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-DUP01-SPR23 680-236128-13	FD	1,2-Dichlorobenzene	2.00	0.310 J	0.310 J	+	ug/l	I/TR
32M-DUP01-SPR23 680-236128-13	FD	Trichloroethene (TCE)	1.00	0.350 J	0.350 J	+	ug/l	I/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: MADEPVP		**Extraction Method: SW5030C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Benzene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U	20.0 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	Ethylbenzene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	m,p-Xylene	10.0	5.00 U	5.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U	2.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	Naphthalene	6.00	4.00 U	4.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	o-Xylene	5.00	2.00 U	2.00 UJ		ug/l	P
32M-01-14XOB-SPR23 680-236128-11	N	Toluene	5.00	2.00 U	2.00 UJ		ug/l	P

Test Method: SW8260D		**Extraction Method: SW5030C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-14XOB-SPR23 680-236128-11	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-01-18XBR-SPR23 680-236128-12	N	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR23 680-236128-12	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-DUP01-SPR23 680-236128-13	FD	1,2-Dichlorobenzene	2.00	0.310 J	0.310 J	+	ug/l	I/TR
32M-DUP01-SPR23 680-236128-13	FD	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-DUP01-SPR23 680-236128-13	FD	Trichloroethene (TCE)	1.00	0.350 J	0.350 J	+	ug/l	I/TR
32M-DUP01-SPR23 680-236128-13	FD	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1
32M-TB-01-SPR23 680-236128-14	TB	Bromoform	2.50	2.00 U Q	2.00 UJ		ug/l	V2

Table of All Qualified Results

Test Method: SW8260D		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-TB-01-SPR23 680-236128-14	TB	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5/V1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPVP

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Benzene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	20.0 U	20.0 U	20.0 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	50.0 U	50.0 U	50.0 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	Ethylbenzene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	m,p-Xylene	10.0	5.00 U	5.00 U	5.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	Methyl tert-butyl ether (MTBE)	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	Naphthalene	6.00	4.00 U	4.00 U	4.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	o-Xylene	5.00	2.00 U	2.00 U	2.00 UJ	P
32M-01-14XOB-SPR23 680-236128-11	N	Toluene	5.00	2.00 U	2.00 U	2.00 UJ	P

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
32M-01-14XOB-SPR23 680-236128-11	N	Bromoform	2.50	2.00 U Q	2.00 X	2.00 UJ	V2
32M-01-14XOB-SPR23 680-236128-11	N	Vinyl acetate	2.50	2.00 U Q	2.00 X	2.00 UJ	V5/V1
32M-01-18XBR-SPR23 680-236128-12	N	Bromoform	2.50	2.00 U Q	2.00 X	2.00 UJ	V2
32M-01-18XBR-SPR23 680-236128-12	N	Vinyl acetate	2.50	2.00 U Q	2.00 X	2.00 UJ	V5/V1
32M-DUP01-SPR23 680-236128-13	FD	Bromoform	2.50	2.00 U Q	2.00 X	2.00 UJ	V2
32M-DUP01-SPR23 680-236128-13	FD	Vinyl acetate	2.50	2.00 U Q	2.00 X	2.00 UJ	V5/V1
32M-TB-01-SPR23 680-236128-14	TB	Bromoform	2.50	2.00 U Q	2.00 X	2.00 UJ	V2
32M-TB-01-SPR23 680-236128-14	TB	Vinyl acetate	2.50	2.00 U Q	2.00 X	2.00 UJ	V5/V1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
C	LCS Recovery
I	Surrogate recovery outside project limits.
L	Lab Blank
P	Sample preservation/collection requirement not met.
TR	Trace Level Detect
V1	ICV
V2	CCV
V5	Ending Continuing Calibration Verification

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?		•		Headspace requirement not met for one sample. Results were qualified J/UJ.
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW8260D (Volatile Organic Compounds by GC/MS)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		CCV and closing CCV out of limits for several compounds. All results were non-detect and qualified UJ.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?		•		ICV %D outside of limits for several compounds. All results were non-detect and qualified UJ.
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?		•		Several surrogates are outside of limits. Detect results qualified J.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Two compounds were detect in the method blank. No data were qualified.
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		LCS Recoveries outside of limits. Results non-detect, no data qualified.
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Field Duplicates for SDG: 680-236128-3

Location	Analysis
32M-01-18XBR	MADEPVP

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Benzene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	ND	ND	100	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Ethylbenzene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Naphthalene	ND	ND	6.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	o-Xylene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Toluene	ND	ND	5.00	NA	30	NA	OK

Location	Analysis
32M-01-18XBR	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Manganese (TOTREC)	1300	1300	10.0	0.00	30	OK	NA

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Field Duplicates for SDG: 680-236128-3

Location	Analysis
32M-01-18XBR	SW6020A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Arsenic (TOTREC)	2.50	1.90	5.00	27.3	30	NA	OK

Location	Analysis
32M-01-18XBR	SW8260D

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1,1,2-Tetrachloroethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1,1-Trichloroethane	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1,2,2-Tetrachloroethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1,2-Trichloroethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1-Dichloroethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1-Dichloroethene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,1-Dichloropropene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2,3-Trichlorobenzene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2,3-Trichloropropane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2,4-Trichlorobenzene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2,4-Trimethylbenzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dibromo-3-chloropropane	ND	ND	10.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dibromoethane (EDB)	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dichlorobenzene	ND	0.310	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dichloroethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,2-Dichloropropane	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,3,5-Trimethylbenzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,3-Dichlorobenzene	ND	ND	2.00	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Field Duplicates for SDG: 680-236128-3

Location	Analysis
32M-01-18XBR	SW8260D

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,3-Dichloropropane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	1,4-Dichlorobenzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	2,2-Dichloropropane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	2-Butanone (MEK)	ND	ND	25.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	2-Chlorotoluene	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	2-Hexanone	ND	ND	20.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	4-Chlorotoluene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	4-Methyl-2-pentanone (MIBK)	ND	ND	20.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Acetone	ND	ND	25.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Benzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Bromobenzene	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Bromochloromethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Bromodichloromethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Bromoform	ND	ND	2.50	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Bromomethane	ND	ND	20.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Carbon disulfide	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Carbon Tetrachloride	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Chlorobenzene	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Chloroethane	ND	ND	20.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Chloroform	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Chloromethane	ND	ND	2.50	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	cis-1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	cis-1,3-Dichloropropene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Cumene	ND	ND	2.00	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Field Duplicates for SDG: 680-236128-3

Location	Analysis
32M-01-18XBR	SW8260D

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Dibromochloromethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Dibromomethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Dichlorodifluoromethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Ethylbenzene	ND	ND	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Hexachlorobutadiene	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	m,p-Xylene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Methylene chloride	ND	ND	20.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	n-Butylbenzene	ND	ND	2.50	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	n-Propylbenzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Naphthalene	ND	ND	10.0	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	o-Xylene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	p-Cymene (p-Isopropyltoluene)	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	sec-Butylbenzene	ND	ND	2.50	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Styrene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	tert-Butylbenzene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Tetrachloroethene (PCE)	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Toluene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	trans-1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	trans-1,3-Dichloropropene	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Trichloroethene (TCE)	ND	0.350	1.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Trichlorofluoromethane	ND	ND	2.00	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Vinyl acetate	ND	ND	2.50	NA	30	NA	OK
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Vinyl chloride	ND	ND	2.00	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2023
Field Duplicates for SDG: 680-236128-3

Location	Analysis
32M-01-18XBR	SW8260D

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
32M-01-18XBR-SPR23 / 32M-DUP01-SPR23	680-236128-12 / 680-236128-13	Xylenes, Total	ND	ND	2.00	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 28, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on July 26, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57156_F:

SDG #	**Fraction**
680-236128-2	Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

547 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		As,Mn (6010C /6020A)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH		EPH (MADEP -EPH		Methane Ethane Ethene																	
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	8	0	-	-	-	-	-	-	7	0	-	-	-	-	6	0																
B	680-236086-1	07/26/23	08/09/23	5	0	-	-	-	-	-	-	4	0	-	-	-	-	3	0																
C	680-236086-2	07/26/23	08/09/23	2	0	-	-	-	-	2	0	-	-	2	0	-	-	-	-																
D	680-236120-1	07/26/23	08/09/23	-	-	5	0	5	0	-	-	-	-	5	0	10	0	-	-																
E	680-236128-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
F	680-236128-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	4	0	-	-	-	-	-	-																
G	680-236128-3	07/26/23	08/09/23	6	0	-	-	-	-	4	0	-	-	4	0	-	-	-	-																
H	680-236378-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	14	0	-	-	-	-	-	-																
I	680-236434-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	18	0	-	-	-	-	-	-																
J	680-236498-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	2	0	-	-	-	-	-	-																
K	680-236498-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	26	0	-	-	-	-	-	-																
L	680-236818-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
M	680-237047-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-																
Total	TR/PG			24	0	5	0	5	0	6	0	86	0	11	0	10	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO_3 /NO_2-N (353.2)		SO_4 (9056A)		S= (9034)		TDS (2540C)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	6	0	-	-	-	-	-	-	-	-	6	0	6	0	6	0	-	-	6	0												
B	680-236086-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	-	-	3	0	3	0	3	0	-	-	3	0												
D	680-236120-1	07/26/23	08/09/23	5	0	5	0	5	0	5	0	-	-	5	0	5	0	-	-	5	0	-	-												
E	680-236128-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
H	680-236378-1	07/26/23	08/09/23	14	0	-	-	-	-	14	0	14	0	-	-	14	0	-	-	-	-	-	-												
I	680-236434-1	07/26/23	08/09/23	18	0	-	-	-	-	18	0	18	0	-	-	18	0	-	-	-	-	-	-												
K	680-236498-2	07/26/23	08/09/23	25	0	-	-	-	-	25	0	25	0	-	-	25	0	-	-	-	-	-	-												
L	680-236818-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
M	680-237047-1	07/26/23	08/09/23	1	0	-	-	-	-	1	0	1	0	-	-	1	0	-	-	-	-	-	-												
Total	TR/PG			82	0	5	0	5	0	73	0	68	0	14	0	82	0	9	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0	0	352

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-236128-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2023
SDG:	680-236128-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Allie Jefferson, Chemist/ERPIMS Specialist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	August 24, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C	SW6010C - Dissolved	SW6020A	SW6020A - Dissolved
57M-95-03X-SPR23	680-236128-7	Water	Field Sample/N	X		X	
57M-96-11X-SPR23	680-236128-8	Water	Field Sample/N	X		X	
57M-DUP01-SPR23	680-236128-9	Water	Field Duplicate/FD	X		X	
57-SW1-SPR23	680-236128-6	Water	Field Sample/N		X		X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-236128-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (8.33%) out of the 12 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.

August 24, 2023

Reviewed by Allie Jefferson, Chemist/ERPIMS Specialist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

August 28, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6020A, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
57M-95-03X-SPR23 (SD)	Arsenic	118	84 - 116	10 - 125	percent	J/None	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW6020A, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
57M-95-03X-SPR23 680-236128-7	N	Arsenic	5.00	13.0 J1	13.0 J	+	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: SW6020A		**Extraction Method: TOTREC**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
57M-95-03X-SPR23 680-236128-7	N	Arsenic	5.00	13.0 J1	13.0 J	+	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		MS recovery outside of limits for Arsenic. Parent result qualified J.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2023
Field Duplicates for SDG: 680-236128-2

Location	Analysis
57M-96-11X	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
57M-96-11X-SPR23 / 57M-DUP01-SPR23	680-236128-8 / 680-236128-9	Iron (TOTREC)	19000	20000	100	5.13	30	OK	NA
57M-96-11X-SPR23 / 57M-DUP01-SPR23	680-236128-8 / 680-236128-9	Manganese (TOTREC)	3500	3600	10.0	2.82	30	OK	NA

Location	Analysis
57M-96-11X	SW6020A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
57M-96-11X-SPR23 / 57M-DUP01-SPR23	680-236128-8 / 680-236128-9	Arsenic (TOTREC)	20.0	17.0	5.00	16.2	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 28, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on July 26, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57156_D:

SDG #	Fraction
680-236120-1	Alkalinity, Total Dissolved Solids, Extractable Petroleum Hydrocarbons, Volatile Petroleum Hydrocarbons, Organochlorine Pesticides

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

547 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		As,Mn (6010C /6020A)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH		EPH (MADEP -EPH		Methane Ethane Ethene																	
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	8	0	-	-	-	-	-	-	7	0	-	-	-	-	6	0																
B	680-236086-1	07/26/23	08/09/23	5	0	-	-	-	-	-	-	4	0	-	-	-	-	3	0																
C	680-236086-2	07/26/23	08/09/23	2	0	-	-	-	-	2	0	-	-	2	0	-	-	-	-																
D	680-236120-1	07/26/23	08/09/23	-	-	5	0	5	0	-	-	-	-	5	0	10	0	-	-																
E	680-236128-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
F	680-236128-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	4	0	-	-	-	-	-	-																
G	680-236128-3	07/26/23	08/09/23	6	0	-	-	-	-	4	0	-	-	4	0	-	-	-	-																
H	680-236378-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	14	0	-	-	-	-	-	-																
I	680-236434-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	18	0	-	-	-	-	-	-																
J	680-236498-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	2	0	-	-	-	-	-	-																
K	680-236498-2	07/26/23	08/09/23	-	-	-	-	-	-	-	-	26	0	-	-	-	-	-	-																
L	680-236818-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	5	0	-	-	-	-	-	-																
M	680-237047-1	07/26/23	08/09/23	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-																
Total	TR/PG			24	0	5	0	5	0	6	0	86	0	11	0	10	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156

Stage 2B EQUIS EDD

LDC# 57156 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO_3 /NO_2-N (353.2)		SO_4 (9056A)		S= (9034)		TDS (2540C)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-236018-1	07/26/23	08/09/23	6	0	-	-	-	-	-	-	-	-	6	0	6	0	6	0	-	-	6	0												
B	680-236086-1	07/26/23	08/09/23	3	0	-	-	-	-	-	-	-	-	3	0	3	0	3	0	-	-	3	0												
D	680-236120-1	07/26/23	08/09/23	5	0	5	0	5	0	5	0	-	-	5	0	5	0	-	-	5	0	-	-												
E	680-236128-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
H	680-236378-1	07/26/23	08/09/23	14	0	-	-	-	-	14	0	14	0	-	-	14	0	-	-	-	-	-	-												
I	680-236434-1	07/26/23	08/09/23	18	0	-	-	-	-	18	0	18	0	-	-	18	0	-	-	-	-	-	-												
K	680-236498-2	07/26/23	08/09/23	25	0	-	-	-	-	25	0	25	0	-	-	25	0	-	-	-	-	-	-												
L	680-236818-1	07/26/23	08/09/23	5	0	-	-	-	-	5	0	5	0	-	-	5	0	-	-	-	-	-	-												
M	680-237047-1	07/26/23	08/09/23	1	0	-	-	-	-	1	0	1	0	-	-	1	0	-	-	-	-	-	-												
Total	TR/PG			82	0	5	0	5	0	73	0	68	0	14	0	82	0	9	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0	0	352

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-236120-1

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
SDG:	680-236120-1
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Allie Jefferson, Chemist/ERPIMS Specialist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	August 24, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	A2540C	E353.2	E410.4	MADEPEP	MADEPVP	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9056A
LFM-03-07-SPR23	680-236120-1	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-02B-SPR23	680-236120-2	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-05A-SPR23	680-236120-3	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-06A-RP-SPR23	680-236120-5	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-DUP01-SPR23	680-236120-4	Water	Field Duplicate/FD	X	X	X	X	X	X	X	X	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA and were reported under sample delivery group (SDG) 680-236120-1. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 171 results (50.29%) out of the 340 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

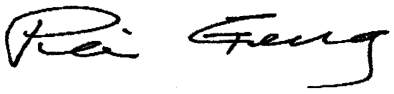
Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
A2540C	No additional comments; see Checklist for detail.
E353.2	No additional comments; see Checklist for detail.
E410.4	No additional comments; see Checklist for detail.
MADEPEP	All Reanalysis results were determined not reportable. Initial results are reported.
MADEPVP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.

August 24, 2023

Reviewed by Allie Jefferson, Chemist/ERPIMS Specialist,
Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

August 28, 2023

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method E410.4, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB28061625529 (CB)	Chemical Oxygen Demand	11.0	< 8.7	< 20	mg/l	U/None*	B2	
CCB28061678329 (CB)	Chemical Oxygen Demand	13.6	< 8.7	< 20	mg/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Quality Control Outliers for test method MADEPEP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB4103889801C (LB)	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	19.9	< 10	< 40	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR23 680-236120-2	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	17.0 J H	39.0 UJ		ug/l	L/H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method MADEPEP, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS4103889802B (BS)	C9-C18 Petroleum Hydrocarbons, Aliphatic	38.0	40 - 140	10 - 140	percent	J/UJ	C	
LCS4103889802C (BS)	2-Methylnaphthalene	36.0	40 - 140	10 - 140	percent	J/UJ	C	
LCS4103889802C (BS)	Naphthalene	33.0	40 - 140	10 - 140	percent	J/UJ	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-SPR23 680-236120-1	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-03-07-SPR23 680-236120-1	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	88.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-03-07-SPR23 680-236120-1	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	2-Methylnaphthalene	2.10	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	93.0	62.0 U H Q	62.0 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Naphthalene	2.10	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	2-Methylnaphthalene	1.90	1.10 U H Q	1.10 UJ		ug/l	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	86.0	57.0 U H Q	57.0 UJ		ug/l	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Naphthalene	1.90	1.10 U H Q	1.10 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method MADEPEP, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR23 (SD)	2-Methylnaphthalene	37.2	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Acenaphthene	36.6	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Acenaphthylene	35.4	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Anthracene	34.9	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Benzo (a)anthracene	34.3	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Benzo(a)pyrene	34.4	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Benzo (b)fluoranthene	35.3	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Benzo (g,h,i)perylene	33.8	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Benzo (k)fluoranthene	33.4	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Chrysene	33.6	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Dibenz (a,h)anthracene	32.0	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Fluoranthene	34.3	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Fluorene	36.1	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Indeno(1,2,3-c,d)pyrene	35.2	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Naphthalene	33.6	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Phenanthrene	34.8	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR23 (SD)	Pyrene	34.1	< 25	< 25	rpd	J/None	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS RPD for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR23 680-236120-2	N	Phenanthrene	1.90	0.930 J H Q	0.930 J		ug/l	D/TR/H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method MADEPVP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR23 (MS)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	150	70 - 130	10 - 130	percent	J/None	M	
LFM-99-02B-SPR23 (SD)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	132	70 - 130	10 - 130	percent	J/None	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68078359334 (CV)	p,p'-DDD	78.0	80 - 120	80 - 120	percent	J/X	V2	
CCV68078359334 (CV)	p,p'-DDE	78.0	80 - 120	80 - 120	percent	J/X	V2	
CCV68078359334 (CV)	p,p'-DDT	76.0	80 - 120	80 - 120	percent	J/X	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDD	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDE	0.0490	0.00390 U M Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDT	0.0490	0.00390 U M	0.00390 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6807834382A (BS)	Aldrin	38.0	45 - 134	10 - 134	percent	J/UJ	C	
LCS6807834382A (BS)	alpha-BHC (alpha-Hexachlorocyclohexane)	41.0	54 - 138	10 - 138	percent	J/UJ	C	
LCS6807834382A (BS)	alpha-Endosulfan	40.0	62 - 126	10 - 126	percent	J/UJ	C	
LCS6807834382A (BS)	beta-Endosulfan	44.0	52 - 135	10 - 135	percent	J/UJ	C	
LCS6807834382A (BS)	Dieldrin	45.0	60 - 136	10 - 136	percent	J/UJ	C	
LCS6807834382A (BS)	Endosulfan sulfate	53.0	62 - 133	10 - 133	percent	J/UJ	C	
LCS6807834382A (BS)	Endrin	50.0	60 - 138	10 - 138	percent	J/UJ	C	
LCS6807834382A (BS)	Endrin aldehyde	42.0	51 - 132	10 - 132	percent	J/UJ	C	
LCS6807834382A (BS)	Endrin ketone	47.0	58 - 134	10 - 134	percent	J/UJ	C	
LCS6807834382A (BS)	gamma-BHC (Lindane)	43.0	59 - 134	10 - 134	percent	J/UJ	C	
LCS6807834382A (BS)	Heptachlor	48.0	54 - 130	10 - 130	percent	J/UJ	C	
LCS6807834382A (BS)	Heptachlor epoxide	44.0	61 - 133	10 - 133	percent	J/UJ	C	
LCS6807834382A (BS)	p,p'-DDD	51.0	56 - 143	10 - 143	percent	J/UJ	C	
LCS6807834382A (BS)	p,p'-DDE	46.0	57 - 135	10 - 135	percent	J/UJ	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-SPR23 680-236120-1	N	Aldrin	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	alpha-Endosulfan	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	beta-Endosulfan	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Dieldrin	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endosulfan sulfate	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin aldehyde	0.0480	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin ketone	0.0480	0.0160 U Q	0.0160 UJ		ug/l	C

Qualified Results associated with the LCS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-SPR23 680-236120-1	N	gamma-BHC (Lindane)	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Heptachlor	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Heptachlor epoxide	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	p,p'-DDD	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	p,p'-DDE	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Aldrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	alpha-Endosulfan	0.0490	0.00390 U J1 Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	beta-Endosulfan	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Dieldrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Endosulfan sulfate	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	Endrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	Endrin aldehyde	0.0490	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Endrin ketone	0.0490	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	gamma-BHC (Lindane)	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Heptachlor	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Heptachlor epoxide	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDD	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDE	0.0490	0.00390 U M Q	0.00390 UJ		ug/l	C/V2
LFM-99-05A-SPR23 680-236120-3	N	Aldrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	alpha-Endosulfan	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	beta-Endosulfan	0.0520	0.00420 U M Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Dieldrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endosulfan sulfate	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endrin aldehyde	0.0520	0.0170 U Q	0.0170 UJ		ug/l	C

Qualified Results associated with the LCS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-05A-SPR23 680-236120-3	N	Endrin ketone	0.0520	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	gamma-BHC (Lindane)	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Heptachlor	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Heptachlor epoxide	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	p,p'-DDD	0.0520	0.00420 U MQ	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	p,p'-DDE	0.0520	0.00420 U MQ	0.00420 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Aldrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	alpha-Endosulfan	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	beta-Endosulfan	0.0480	0.00380 U MQ	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Dieldrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endosulfan sulfate	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin aldehyde	0.0480	0.0150 U MQ	0.0150 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin ketone	0.0480	0.0150 U Q	0.0150 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	gamma-BHC (Lindane)	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Heptachlor	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Heptachlor epoxide	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	p,p'-DDD	0.0480	0.00380 U MQ	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	p,p'-DDE	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Aldrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	alpha-Endosulfan	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	beta-Endosulfan	0.0530	0.00430 U MQ	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Dieldrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endosulfan sulfate	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C

Qualified Results associated with the LCS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-DUP01-SPR23 680-236120-4	FD	Endrin aldehyde	0.0530	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endrin ketone	0.0530	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	gamma-BHC (Lindane)	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Heptachlor	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Heptachlor epoxide	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	p,p'-DDD	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	p,p'-DDE	0.0530	0.00430 U M Q	0.00430 UJ		ug/l	C

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR23 (SD)	delta-BHC (delta-Hexachlorocyclohexane)	31.7	< 30	< 30	rpd	J/None	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-SPR23 680-236120-1	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-03-07-SPR23 680-236120-1	N	Acenaphthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Acenaphthylene	1.90	1.40 U H Q	1.40 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Anthracene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(a)anthracene	1.90	1.40 U H	1.40 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(a)pyrene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	29.0 U H	29.0 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	19.0 UHMQ	19.0 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	88.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-03-07-SPR23 680-236120-1	N	Chrysene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Dibenz(a,h)anthracene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Fluoranthene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Fluorene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-03-07-SPR23 680-236120-1	N	Phenanthrene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-03-07-SPR23 680-236120-1	N	Pyrene	12.0	9.70 U H	9.70 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Acenaphthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Acenaphthylene	1.90	1.40 U H Q	1.40 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Anthracene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR23 680-236120-2	N	Benzo(a)anthracene	1.90	1.40 U H	1.40 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(a)pyrene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	17.0 J H	39.0 UJ		ug/l	L/H1
LFM-99-02B-SPR23 680-236120-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Chrysene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Dibenz(a,h)anthracene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Fluoranthene	1.90	0.970 U H	0.970 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Fluorene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-02B-SPR23 680-236120-2	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Phenanthrene	1.90	0.930 J H Q	0.930 J		ug/l	D/TR/H1
LFM-99-02B-SPR23 680-236120-2	N	Pyrene	12.0	9.70 U H	9.70 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	2-Methylnaphthalene	2.10	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Acenaphthene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Acenaphthylene	2.10	1.40 U H Q	1.40 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Anthracene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(a)anthracene	2.10	1.40 U H	1.40 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(a)pyrene	2.10	1.20 U H	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(b)fluoranthene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(g,h,i)perylene	2.10	1.20 U H	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(k)fluoranthene	4.10	3.10 U H	3.10 UJ		ug/l	H1

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-05A-SPR23 680-236120-3	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	41.0	31.0 U H	31.0 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	51.0	21.0 U H Q	21.0 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	93.0	62.0 U H Q	62.0 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Chrysene	2.10	1.00 U H	1.00 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Dibenz(a,h)anthracene	2.10	1.00 U H	1.00 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Fluoranthene	2.10	1.00 U H	1.00 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Fluorene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Indeno(1,2,3-c,d)pyrene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Naphthalene	2.10	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Phenanthrene	2.10	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-99-05A-SPR23 680-236120-3	N	Pyrene	12.0	10.0 U H	10.0 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	2-Methylnaphthalene	1.90	1.10 U H Q	1.10 UJ		ug/l	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Acenaphthene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Acenaphthylene	1.90	1.30 U H Q	1.30 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Anthracene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(a)anthracene	1.90	1.30 U H	1.30 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(a)pyrene	1.90	1.10 U H	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(b)fluoranthene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(g,h,i)perylene	1.90	1.10 U H	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(k)fluoranthene	3.80	2.90 U H	2.90 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	29.0 U H	29.0 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	86.0	57.0 U H Q	57.0 UJ		ug/l	C/H1

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-06A-RP-SPR23 680-236120-5	N	Chrysene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Dibenz(a,h)anthracene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Fluoranthene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Fluorene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Indeno(1,2,3-c,d)pyrene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Naphthalene	1.90	1.10 U H Q	1.10 UJ		ug/l	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Phenanthrene	1.90	1.10 U H Q	1.10 UJ		ug/l	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Pyrene	11.0	9.60 U H	9.60 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Acenaphthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Acenaphthylene	1.90	1.30 U H Q	1.30 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Anthracene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(a)anthracene	1.90	1.30 U H	1.30 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(a)pyrene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	29.0 U H	29.0 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Chrysene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Dibenz(a,h)anthracene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Fluoranthene	1.90	0.960 U H	0.960 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Fluorene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-DUP01-SPR23 680-236120-4	FD	Naphthalene	1.90	1.20 U H Q	1.20 UJ		ug/l	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Phenanthrene	1.90	1.20 U H Q	1.20 UJ		ug/l	H1
LFM-DUP01-SPR23 680-236120-4	FD	Pyrene	12.0	9.60 U H	9.60 UJ		ug/l	H1

Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-SPR23 680-236120-1	N	Aldrin	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	alpha-Endosulfan	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	beta-Endosulfan	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Dieldrin	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endosulfan sulfate	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin aldehyde	0.0480	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Endrin ketone	0.0480	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	gamma-BHC (Lindane)	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Heptachlor	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	Heptachlor epoxide	0.0480	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	p,p'-DDD	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-03-07-SPR23 680-236120-1	N	p,p'-DDE	0.0480	0.00390 U M Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Aldrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	alpha-Endosulfan	0.0490	0.00390 U J1 Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	beta-Endosulfan	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Dieldrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Endosulfan sulfate	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	Endrin	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	Endrin aldehyde	0.0490	0.0160 U Q	0.0160 UJ		ug/l	C

Table of All Qualified Results

Test Method: SW8081B		**Extraction Method: SW3510C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR23 680-236120-2	N	Endrin ketone	0.0490	0.0160 U Q	0.0160 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	gamma-BHC (Lindane)	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Heptachlor	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	Heptachlor epoxide	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDD	0.0490	0.00390 U Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDE	0.0490	0.00390 U M Q	0.00390 UJ		ug/l	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDT	0.0490	0.00390 U M	0.00390 UJ		ug/l	V2
LFM-99-05A-SPR23 680-236120-3	N	Aldrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	alpha-Endosulfan	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	beta-Endosulfan	0.0520	0.00420 U M Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Dieldrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endosulfan sulfate	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endrin	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endrin aldehyde	0.0520	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Endrin ketone	0.0520	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	gamma-BHC (Lindane)	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Heptachlor	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	Heptachlor epoxide	0.0520	0.00420 U Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	p,p'-DDD	0.0520	0.00420 U M Q	0.00420 UJ		ug/l	C
LFM-99-05A-SPR23 680-236120-3	N	p,p'-DDE	0.0520	0.00420 U M Q	0.00420 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Aldrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	alpha-Endosulfan	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	beta-Endosulfan	0.0480	0.00380 U M Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Dieldrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endosulfan sulfate	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C

Table of All Qualified Results

Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin aldehyde	0.0480	0.0150 U M Q	0.0150 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Endrin ketone	0.0480	0.0150 U Q	0.0150 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	gamma-BHC (Lindane)	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Heptachlor	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	Heptachlor epoxide	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	p,p'-DDD	0.0480	0.00380 U M Q	0.00380 UJ		ug/l	C
LFM-99-06A-RP-SPR23 680-236120-5	N	p,p'-DDE	0.0480	0.00380 U Q	0.00380 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Aldrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	alpha-Endosulfan	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	beta-Endosulfan	0.0530	0.00430 U M Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Dieldrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endosulfan sulfate	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endrin	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endrin aldehyde	0.0530	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Endrin ketone	0.0530	0.0170 U Q	0.0170 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	gamma-BHC (Lindane)	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Heptachlor	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	Heptachlor epoxide	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	p,p'-DDD	0.0530	0.00430 U Q	0.00430 UJ		ug/l	C
LFM-DUP01-SPR23 680-236120-4	FD	p,p'-DDE	0.0530	0.00430 U M Q	0.00430 UJ		ug/l	C

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-03-07-SPR23 680-236120-1	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-03-07-SPR23 680-236120-1	N	Acenaphthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Acenaphthylene	1.90	1.40 U H Q	1.40 U	1.40 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Anthracene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(a)anthracene	1.90	1.40 U H	1.40 U	1.40 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(a)pyrene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 U	2.90 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	29.0 U H	29.0 U	29.0 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	19.0 UHMQ	19.0 U	19.0 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	88.0	58.0 U H Q	58.0 UJ	58.0 UJ	C/H1
LFM-03-07-SPR23 680-236120-1	N	Chrysene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Dibenz(a,h)anthracene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Fluoranthene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Fluorene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-03-07-SPR23 680-236120-1	N	Phenanthrene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-03-07-SPR23 680-236120-1	N	Pyrene	12.0	9.70 U H	9.70 U	9.70 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Acenaphthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Acenaphthylene	1.90	1.40 U H Q	1.40 U	1.40 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Anthracene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-02B-SPR23 680-236120-2	N	Benzo(a)anthracene	1.90	1.40 U H	1.40 U	1.40 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(a)pyrene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 U	2.90 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	17.0 J H	39.0 U	39.0 UJ	L/H1
LFM-99-02B-SPR23 680-236120-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 U	19.0 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ	58.0 UJ	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Chrysene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Dibenz(a,h)anthracene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Fluoranthene	1.90	0.970 U H	0.970 U	0.970 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Fluorene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-02B-SPR23 680-236120-2	N	Naphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-99-02B-SPR23 680-236120-2	N	Phenanthrene	1.90	0.930 J H Q	0.930 J	0.930 J	D/TR/H1
LFM-99-02B-SPR23 680-236120-2	N	Pyrene	12.0	9.70 U H	9.70 U	9.70 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	2-Methylnaphthalene	2.10	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Acenaphthene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Acenaphthylene	2.10	1.40 U H Q	1.40 U	1.40 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Anthracene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(a)anthracene	2.10	1.40 U H	1.40 U	1.40 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(a)pyrene	2.10	1.20 U H	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(b)fluoranthene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(g,h,i)perylene	2.10	1.20 U H	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Benzo(k)fluoranthene	4.10	3.10 U H	3.10 U	3.10 UJ	H1

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-05A-SPR23 680-236120-3	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	41.0	31.0 U H	31.0 U	31.0 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	51.0	21.0 U H Q	21.0 U	21.0 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	93.0	62.0 U H Q	62.0 UJ	62.0 UJ	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Chrysene	2.10	1.00 U H	1.00 U	1.00 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Dibenz(a,h)anthracene	2.10	1.00 U H	1.00 U	1.00 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Fluoranthene	2.10	1.00 U H	1.00 U	1.00 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Fluorene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Indeno(1,2,3-c,d)pyrene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Naphthalene	2.10	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-99-05A-SPR23 680-236120-3	N	Phenanthrene	2.10	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-99-05A-SPR23 680-236120-3	N	Pyrene	12.0	10.0 U H	10.0 U	10.0 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	2-Methylnaphthalene	1.90	1.10 U H Q	1.10 UJ	1.10 UJ	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Acenaphthene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Acenaphthylene	1.90	1.30 U H Q	1.30 U	1.30 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Anthracene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(a)anthracene	1.90	1.30 U H	1.30 U	1.30 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(a)pyrene	1.90	1.10 U H	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(b)fluoranthene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(g,h,i)perylene	1.90	1.10 U H	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Benzo(k)fluoranthene	3.80	2.90 U H	2.90 U	2.90 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	29.0 U H	29.0 U	29.0 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 U	19.0 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	86.0	57.0 U H Q	57.0 UJ	57.0 UJ	C/H1

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-06A-RP-SPR23 680-236120-5	N	Chrysene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Dibenz(a,h)anthracene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Fluoranthene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Fluorene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Indeno(1,2,3-c,d)pyrene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Naphthalene	1.90	1.10 U H Q	1.10 UJ	1.10 UJ	C/H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Phenanthrene	1.90	1.10 U H Q	1.10 U	1.10 UJ	H1
LFM-99-06A-RP-SPR23 680-236120-5	N	Pyrene	11.0	9.60 U H	9.60 U	9.60 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	2-Methylnaphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Acenaphthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Acenaphthylene	1.90	1.30 U H Q	1.30 U	1.30 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Anthracene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(a)anthracene	1.90	1.30 U H	1.30 U	1.30 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(a)pyrene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(b)fluoranthene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(g,h,i)perylene	1.90	1.20 U H	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Benzo(k)fluoranthene	3.90	2.90 U H	2.90 U	2.90 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	39.0	29.0 U H	29.0 U	29.0 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	19.0 UHMQ	19.0 U	19.0 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	87.0	58.0 U H Q	58.0 UJ	58.0 UJ	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Chrysene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Dibenz(a,h)anthracene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Fluoranthene	1.90	0.960 U H	0.960 U	0.960 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Fluorene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Indeno(1,2,3-c,d)pyrene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-DUP01-SPR23 680-236120-4	FD	Naphthalene	1.90	1.20 U H Q	1.20 UJ	1.20 UJ	C/H1
LFM-DUP01-SPR23 680-236120-4	FD	Phenanthrene	1.90	1.20 U H Q	1.20 U	1.20 UJ	H1
LFM-DUP01-SPR23 680-236120-4	FD	Pyrene	12.0	9.60 U H	9.60 U	9.60 UJ	H1

Modified Qualifiers for test method SW8081B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-02B-SPR23 680-236120-2	N	Endosulfan sulfate	0.0490	0.00390 U Q	0.00390 UJ	0.00390 UJ	C/V2
LFM-99-02B-SPR23 680-236120-2	N	Endrin	0.0490	0.00390 U Q	0.00390 UJ	0.00390 UJ	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDD	0.0490	0.00390 U Q	0.00390 X	0.00390 UJ	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDE	0.0490	0.00390 U M Q	0.00390 X	0.00390 UJ	C/V2
LFM-99-02B-SPR23 680-236120-2	N	p,p'-DDT	0.0490	0.00390 U M	0.00390 X	0.00390 UJ	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
B2	CCB
C	LCS Recovery
D	MS RPD
H1	Test Hold Time
L	Lab Blank
M	MS Recovery
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: A2540C (Total Dissolved Solids, Dried at 180 C)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Review Questions

Method: E353.2 (Nitrogen, Nitrate-Nitrite (Colorimetric Automated, Cadmium Reduction))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: E410.4 (Chemical Oxygen Demand (Colorimetric, Automated Manual))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		CB detect.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		All samples were run outside of holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		One compound was detect.
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		Outside limits. Data qualified.
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?		•		Outside limits. Data qualified.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Outside limits
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		CCV %D outside of limits. Data was qualified.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		LCS recovery outside of limits. Data was qualified.
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Review Questions

Method: SW9056A (Anion Chromatography)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?				
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	A2320B

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Alkalinity, Total (as CaCO3)	98.0	98.0	5.00	0.00	30	OK	NA

Location	Analysis
LFM-99-05A	A2540C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Total Dissolved Solids	430	440	24.0	2.30	30	OK	NA

Location	Analysis
LFM-99-05A	E353.2

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Nitrate-Nitrite (as N)	0.410	0.410	0.100	0.00	30	NA	OK

Location	Analysis
LFM-99-05A	E410.4

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Chemical Oxygen Demand	ND	ND	20.0	NA	30	NA	OK

Location	Analysis
LFM-99-05A	MADEPEP

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	2-Methylnaphthalene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Acenaphthene	ND	ND	2.10	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	MADEPEP

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Acenaphthylene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Anthracene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzo(a)anthracene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzo(a)pyrene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzo(b)fluoranthene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzo(g,h,i)perylene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzo(k)fluoranthene	ND	ND	4.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	41.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C19-C36 Petroleum Hydrocarbons, Aliphatic	ND	ND	51.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C9-C18 Petroleum Hydrocarbons, Aliphatic	ND	ND	93.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Chrysene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Dibenz(a,h)anthracene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Fluoranthene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Fluorene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Indeno(1,2,3-c,d)pyrene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Naphthalene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Phenanthrene	ND	ND	2.10	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Pyrene	ND	ND	12.0	NA	30	NA	OK

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Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	MADEPVP

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Benzene	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	ND	ND	100	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Ethylbenzene	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Naphthalene	ND	ND	6.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	o-Xylene	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Toluene	ND	ND	5.00	NA	30	NA	OK

Location	Analysis
LFM-99-05A	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Barium (TOTREC)	15.0	14.0	20.0	6.90	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Cadmium (TOTREC)	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Chromium (TOTREC)	ND	ND	10.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Copper (TOTREC)	ND	ND	20.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Iron (TOTREC)	ND	ND	100	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Lead (TOTREC)	ND	ND	40.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Manganese (TOTREC)	ND	ND	10.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Selenium (TOTREC)	ND	ND	25.0	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Silver (TOTREC)	ND	ND	10.0	NA	30	NA	OK

Location	Analysis
LFM-99-05A	SW6020A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Arsenic (TOTREC)	ND	ND	5.00	NA	30	NA	OK

Location	Analysis
LFM-99-05A	SW7470A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Mercury (TOTAL)	ND	ND	0.250	NA	30	NA	OK

Location	Analysis
LFM-99-05A	SW8081B

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Aldrin	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	alpha-BHC (alpha-Hexachlorocyclohexane)	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	alpha-Endosulfan	ND	ND	0.0520	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	SW8081B

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	beta-BHC (beta-Hexachlorocyclohexane)	0.00970	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	beta-Endosulfan	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Chlordane	ND	ND	0.520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	delta-BHC (delta-Hexachlorocyclohexane)	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Dieldrin	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Endosulfan sulfate	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Endrin	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Endrin aldehyde	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Endrin ketone	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	gamma-BHC (Lindane)	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Heptachlor	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Heptachlor epoxide	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Methoxychlor	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	p,p'-DDD	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	p,p'-DDE	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	p,p'-DDT	ND	ND	0.0520	NA	30	NA	OK
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Toxaphene	ND	ND	5.20	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2023
Field Duplicates for SDG: 680-236120-1

Location	Analysis
LFM-99-05A	SW9012B

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Cyanide	ND	ND	0.0100	NA	30	NA	OK

Location	Analysis
LFM-99-05A	SW9056A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Chloride	170	180	1.00	5.71	30	OK	NA
LFM-99-05A-SPR23 / LFM-DUP01-SPR23	680-236120-3 / 680-236120-4	Sulfate	16.0	17.0	2.00	6.06	30	OK	NA

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

April 1, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on February 20, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58614:

SDG #	Fraction
680-242830-1/SQ6279	Chlorinated Pesticides, Volatile Petroleum Hydrocarbons, Diesel Range Organics

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

96 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58614 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Pest. (8081B)		Metals (6010C/20A /7470A)		VPH (MADEP -VPH		EPH (MADEP -EPH		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		NO_3 /NO_2-N (353.2)		SO_4 (9056A)		TDS (2540C)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-242830-1/SQ6279	02/20/24	03/12/24	5	0	5	0	6	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0										
Total	TR/PG			5	0	5	0	6	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	56

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Arcadis\Fort Devens\58614ST.wpd

Data Validation Report for 680-242830-1

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2023
SDG:	680-242830-1
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 01, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	A2540C	E353.2	E410.4	MADEPEP	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9056A
DCL-DUP01-FAL23	680-242830-1	Water	Field Duplicate/FD	X	X	X	X	X	X	X	X	X	X	X
LFM-03-07-FAL23	680-242830-2	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X
LFM-99-02B-FAL23	680-242830-3	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X
LFM-99-05A-FAL23	680-242830-4	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X
LFM-99-06A-RP-FAL23	680-242830-5	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA and were reported under sample delivery group (SDG) 680-242830-1. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 30 results (10.34%) out of the 290 results (sample and field QC samples) reported are qualified based on review and 1 results (0.34%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

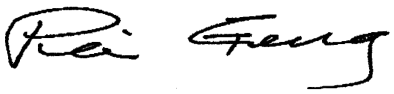
Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
A2540C	No additional comments; see Checklist for detail.
E353.2	No additional comments; see Checklist for detail.
E410.4	No additional comments; see Checklist for detail.
MADEPEP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.

April 01, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 01, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method A2320B, Field Duplicate RPD

Field duplicate analyses are performed in order to assess sample collection/laboratory precision for each sample matrix. Summary forms were evaluated and compared to electronic data deliverables. Field duplicate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL-DUP01-FAL23 (N) 680-242830-1	Alkalinity, Total (as CaCO3)	68.3	< 30	< 30	rpd	J/UJ	D3	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Field Duplicate RPD for A2320B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL23 680-242830-1	FD	Alkalinity, Total (as CaCO3)	5.50	54.0	54.0 J		mg/l	D3
LFM-99-05A-FAL23 680-242830-4	N	Alkalinity, Total (as CaCO3)	5.50	110	110 J		mg/l	D3

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method E353.2, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL23 (MS) 680-242830-3	Nitrate-Nitrite (as N)	1.00	90 - 110	30 - 110	percent	J/X	M	
LFM-99-02B-FAL23 (SD) 680-242830-3	Nitrate-Nitrite (as N)	3.00	90 - 110	30 - 110	percent	J/X	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for E353.2

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	Nitrate-Nitrite (as N)	0.100	0.0250 U J1	0.0250 X		mg/l	D/M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method E353.2, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL23 (SD) 680-242830-3	Nitrate-Nitrite (as N)	70.3	< 10	< 10	rpd	J/UJ	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS RPD for E353.2

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	Nitrate-Nitrite (as N)	0.100	0.0250 U J1	0.0250 X		mg/l	D/M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method MADEPEP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB4104445491B (LB) MB4104445491B	C19-C36 Petroleum Hydrocarbons, Aliphatic	12.8	< 10	< 50	ug/l	U/None*	L	
MB4104445491C (LB) MB4104445491C	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	14.4	< 10	< 40	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-FAL23 680-242830-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	10.0 J	49.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS6808085723 (CV) CCVIS6808085723	Dieldrin	78.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV) CCVIS6808085723	Endosulfan sulfate	75.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV) CCVIS6808085723	Endrin ketone	77.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV) CCVIS6808085723	p,p'-DDE	67.0	80 - 120	80 - 120	percent	J/X	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL23 680-242830-1	FD	Dieldrin	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
DCL-DUP01-FAL23 680-242830-1	FD	Endosulfan sulfate	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
DCL-DUP01-FAL23 680-242830-1	FD	Endrin ketone	0.0530	0.0110 J	0.0110 J	-	ug/l	TR/V2
DCL-DUP01-FAL23 680-242830-1	FD	p,p'-DDE	0.0530	0.00420 U M	0.00420 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Dieldrin	0.0510	0.00410 U	0.00410 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Endosulfan sulfate	0.0510	0.00410 U	0.00410 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Endrin ketone	0.0510	0.0160 J	0.0160 J	-	ug/l	TR/V2
LFM-03-07-FAL23 680-242830-2	N	p,p'-DDE	0.0510	0.00410 U M	0.00410 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	Dieldrin	0.0510	0.00400 U	0.00400 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	Endosulfan sulfate	0.0510	0.00400 U	0.00400 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	Endrin ketone	0.0510	0.0180 J M J1	0.0180 J	-	ug/l	D/TR/V2
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDE	0.0510	0.00400 U	0.00400 UJ		ug/l	V2
LFM-99-05A-FAL23 680-242830-4	N	Dieldrin	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
LFM-99-05A-FAL23 680-242830-4	N	Endosulfan sulfate	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
LFM-99-05A-FAL23 680-242830-4	N	Endrin ketone	0.0530	0.0220 J	0.0220 J	-	ug/l	TR/V2
LFM-99-05A-FAL23 680-242830-4	N	p,p'-DDE	0.0530	0.00420 U M	0.00420 UJ		ug/l	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Dieldrin	0.0540	0.00430 U	0.00430 UJ		ug/l	V2

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-06A-RP-FAL23 680-242830-5	N	Endosulfan sulfate	0.0540	0.00430 U	0.00430 UJ		ug/l	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Endrin ketone	0.0540	0.0220 J M	0.0220 J	-	ug/l	TR/V2
LFM-99-06A-RP-FAL23 680-242830-5	N	p,p'-DDE	0.0540	0.00430 U M	0.00430 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL23 (MS) 680-242830-3	alpha-Endosulfan	42.0	62 - 126	10 - 126	percent	J/UJ	M	
LFM-99-02B-FAL23 (SD) 680-242830-3	alpha-Endosulfan	46.0	62 - 126	10 - 126	percent	J/UJ	M	
LFM-99-02B-FAL23 (MS) 680-242830-3	Endrin	53.0	60 - 138	10 - 138	percent	J/UJ	M	
LFM-99-02B-FAL23 (SD) 680-242830-3	Endrin	52.0	60 - 138	10 - 138	percent	J/UJ	M	
LFM-99-02B-FAL23 (SD) 680-242830-3	p,p'-DDD	54.0	56 - 143	10 - 143	percent	J/UJ	M	
LFM-99-02B-FAL23 (MS) 680-242830-3	p,p'-DDT	48.0	51 - 143	10 - 143	percent	J/UJ	M	
LFM-99-02B-FAL23 (SD) 680-242830-3	p,p'-DDT	50.0	51 - 143	10 - 143	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	alpha-Endosulfan	0.0510	0.00400 U J1 M	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	Endrin	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDD	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDT	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL23 (SD) 680-242830-3	Endrin ketone	37.6	< 30	< 30	rpd	J/None	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS RPD for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	Endrin ketone	0.0510	0.0180 J M J1	0.0180 J	-	ug/l	D/TR/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW9056A, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL23 (MS) 680-242830-3	Chloride	130	87 - 111	10 - 111	percent	J/None	M	Spike amount Insignificant
LFM-99-02B-FAL23 (SD) 680-242830-3	Chloride	130	87 - 111	10 - 111	percent	J/None	M	Spike amount Insignificant

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Table of All Qualified Results

Test Method: A2320B		**Extraction Method: NONE**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL23 680-242830-1	FD	Alkalinity, Total (as CaCO3)	5.50	54.0	54.0 J		mg/l	D3
LFM-99-05A-FAL23 680-242830-4	N	Alkalinity, Total (as CaCO3)	5.50	110	110 J		mg/l	D3

Test Method: E353.2		**Extraction Method: NONE**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	Nitrate-Nitrite (as N)	0.100	0.0250 U J1	0.0250 X		mg/l	D/M

Test Method: MADEPEP		**Extraction Method: SW3510C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-03-07-FAL23 680-242830-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	10.0 J	49.0 U		ug/l	L

Test Method: SW8081B		**Extraction Method: SW3510C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL23 680-242830-1	FD	Dieldrin	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
DCL-DUP01-FAL23 680-242830-1	FD	Endosulfan sulfate	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
DCL-DUP01-FAL23 680-242830-1	FD	Endrin ketone	0.0530	0.0110 J	0.0110 J	-	ug/l	TR/V2
DCL-DUP01-FAL23 680-242830-1	FD	p,p'-DDE	0.0530	0.00420 U M	0.00420 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Dieldrin	0.0510	0.00410 U	0.00410 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Endosulfan sulfate	0.0510	0.00410 U	0.00410 UJ		ug/l	V2
LFM-03-07-FAL23 680-242830-2	N	Endrin ketone	0.0510	0.0160 J	0.0160 J	-	ug/l	TR/V2
LFM-03-07-FAL23 680-242830-2	N	Heptachlor	0.0510	0.00640 J	0.00640 J		ug/l	TR/P1
LFM-03-07-FAL23 680-242830-2	N	p,p'-DDE	0.0510	0.00410 U M	0.00410 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	alpha-Endosulfan	0.0510	0.00400 U J1 M	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	Dieldrin	0.0510	0.00400 U	0.00400 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	Endosulfan sulfate	0.0510	0.00400 U	0.00400 UJ		ug/l	V2
LFM-99-02B-FAL23 680-242830-3	N	Endrin	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	Endrin ketone	0.0510	0.0180 J M J1	0.0180 J	-	ug/l	D/TR/V2
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDD	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDE	0.0510	0.00400 U	0.00400 UJ		ug/l	V2

Table of All Qualified Results

Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDT	0.0510	0.00400 U J1	0.00400 UJ		ug/l	M
LFM-99-05A-FAL23 680-242830-4	N	Dieldrin	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
LFM-99-05A-FAL23 680-242830-4	N	Endosulfan sulfate	0.0530	0.00420 U	0.00420 UJ		ug/l	V2
LFM-99-05A-FAL23 680-242830-4	N	Endrin ketone	0.0530	0.0220 J	0.0220 J	-	ug/l	TR/V2
LFM-99-05A-FAL23 680-242830-4	N	p,p'-DDE	0.0530	0.00420 U M	0.00420 UJ		ug/l	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Dieldrin	0.0540	0.00430 U	0.00430 UJ		ug/l	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Endosulfan sulfate	0.0540	0.00430 U	0.00430 UJ		ug/l	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Endrin ketone	0.0540	0.0220 J M	0.0220 J	-	ug/l	TR/V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Heptachlor	0.0540	0.00310 J	0.00310 J		ug/l	TR/P1
LFM-99-06A-RP-FAL23 680-242830-5	N	p,p'-DDE	0.0540	0.00430 U M	0.00430 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8081B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
DCL-DUP01-FAL23 680-242830-1	FD	Dieldrin	0.0530	0.00420 U	0.00420 X	V2	0.00420 UJ	V2
DCL-DUP01-FAL23 680-242830-1	FD	Endosulfan sulfate	0.0530	0.00420 U	0.00420 X	V2	0.00420 UJ	V2
DCL-DUP01-FAL23 680-242830-1	FD	p,p'-DDE	0.0530	0.00420 U M	0.00420 X	V2	0.00420 UJ	V2
LFM-03-07-FAL23 680-242830-2	N	Dieldrin	0.0510	0.00410 U	0.00410 X	V2	0.00410 UJ	V2
LFM-03-07-FAL23 680-242830-2	N	Endosulfan sulfate	0.0510	0.00410 U	0.00410 X	V2	0.00410 UJ	V2
LFM-03-07-FAL23 680-242830-2	N	Heptachlor	0.0510	0.00640 J	0.00640 J	TR	0.00640 J	TR/P1
LFM-03-07-FAL23 680-242830-2	N	p,p'-DDE	0.0510	0.00410 U M	0.00410 X	V2	0.00410 UJ	V2
LFM-99-02B-FAL23 680-242830-3	N	Dieldrin	0.0510	0.00400 U	0.00400 X	V2	0.00400 UJ	V2
LFM-99-02B-FAL23 680-242830-3	N	Endosulfan sulfate	0.0510	0.00400 U	0.00400 X	V2	0.00400 UJ	V2
LFM-99-02B-FAL23 680-242830-3	N	p,p'-DDE	0.0510	0.00400 U	0.00400 X	V2	0.00400 UJ	V2
LFM-99-05A-FAL23 680-242830-4	N	Dieldrin	0.0530	0.00420 U	0.00420 X	V2	0.00420 UJ	V2
LFM-99-05A-FAL23 680-242830-4	N	Endosulfan sulfate	0.0530	0.00420 U	0.00420 X	V2	0.00420 UJ	V2
LFM-99-05A-FAL23 680-242830-4	N	p,p'-DDE	0.0530	0.00420 U M	0.00420 X	V2	0.00420 UJ	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Dieldrin	0.0540	0.00430 U	0.00430 X	V2	0.00430 UJ	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Endosulfan sulfate	0.0540	0.00430 U	0.00430 X	V2	0.00430 UJ	V2
LFM-99-06A-RP-FAL23 680-242830-5	N	Heptachlor	0.0540	0.00310 J	0.00310 J	TR	0.00310 J	TR/P1
LFM-99-06A-RP-FAL23 680-242830-5	N	p,p'-DDE	0.0540	0.00430 U M	0.00430 X	V2	0.00430 UJ	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
D	MS RPD
D3	Field Duplicate RPD
L	Lab Blank
M	MS Recovery
P1	Column RPD
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high
Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result	

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?		•		Several results qualified J due to field duplicate RPD greater than RPD limits.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: A2540C (Total Dissolved Solids, Dried at 180 C)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: E353.2 (Nitrogen, Nitrate-Nitrite (Colorimetric Automated, Cadmium Reduction))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Result qualified X due to MS/MSD %R below %R rejection limits.
Was the MS/MSD RPD within project acceptance limits?		•		Result qualified J due to MS/MSD RPD greater than RPD limits.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?	•			Result recommended for rejection due to MS/MSD %R failing.

Review Questions

Method: E410.4 (Chemical Oxygen Demand (Colorimetric, Automated Manual))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			Samples were received unpreserved; preservative added to desired pH upon receipt.
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Result qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		Several results qualified UJ due to column RPD greater than RPD limits. Several results qualified J-(detects) or UJ(non-detects) due to CCV%D greater than limits.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Several results qualified UJ due to MS/MSD %R below %R limits.
Was the MS/MSD RPD within project acceptance limits?		•		Result qualified J due to MS/MSD RPD greater than RPD limits.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW9056A (Anion Chromatography)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			ADR report displays MS/MSD %R as 130%, lab report displays MS/MSD %R as 90/91%. Report was manually reviewed and MS/MSD %R was found to be in limits.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for SQ6279

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2023
SDG:	SQ6279
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Katahdin Analytical Services, Scarborough, ME
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 01, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP
DCL-DUP01-FAL23	SQ6279-1	Water	Field Duplicate/FD	X
LFM-03-07-FAL23	SQ6279-2	Water	Field Sample/N	X
LFM-99-02B-FAL23	SQ6279-3	Water	Field Sample/N	X
LFM-99-05A-FAL23	SQ6279-4	Water	Field Sample/N	X
LFM-99-06A-RP-FAL23	SQ6279-5	Water	Field Sample/N	X
TRIP BLANK	SQ6279-6	Water	Trip Blank/TB	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Katahdin Analytical Services, Scarborough, ME and were reported under sample delivery group (SDG) SQ6279. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 10 results (16.67%) out of the 60 results (sample and field QC samples) reported are qualified based on review and 10 results (16.67%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPVP	No additional comments; see Checklist for detail.

April 01, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 01, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method MADEPVP, Test Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of analysis found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
TRIP BLANK (TB) SQ6279-6		38.9	< 14	< 28	days	J/X	H1	Test Exceeds UCL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Test Hold Time for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
TRIP BLANK SQ6279-6	TB	Benzene	3.00	2.00 U	2.00 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Ethylbenzene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	m,p-Xylene	10.0	7.50 U	7.50 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Methyl tert-butyl ether (MTBE)	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Naphthalene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	o-Xylene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Toluene	5.00	3.80 U	3.80 X		ug/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: MADEPVP		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
TRIP BLANK SQ6279-6	TB	Benzene	3.00	2.00 U	2.00 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Ethylbenzene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	m,p-Xylene	10.0	7.50 U	7.50 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Methyl tert-butyl ether (MTBE)	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Naphthalene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	o-Xylene	5.00	3.80 U	3.80 X		ug/l	H1
TRIP BLANK SQ6279-6	TB	Toluene	5.00	3.80 U	3.80 X		ug/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
H1	Test Hold Time

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Results for the TB were qualified X (non-detects) due to analysis outside of twice the holding time requirement.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?	•			
Were target analytes reported in the field blank(s) less than MDL?	•			
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?	•			Results for one sample recommended for exclusion due to analysis outside twice the holding time requirement.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 28, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 4, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58331_E:

SDG #	**Fraction**
680-242837-1	Volatiles, Chlorinated Pesticides, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

341 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		VOA (624)		SVOA (625)		Pest. (8081B)		PCBs (8082A)		Metals (6010C /6020A)		Hg (7470A)		3 D.Met. (6010C /6020A)		DRO (8015C)		Methane Ethane Ethene													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	3	0												
B	680-242109-1	01/04/24	01/18/24	25	0	-	-	-	-	-	-	-	-	-	-	-	-	23	0	-	-	13	0												
C	680-242433-1	01/04/24	01/18/24	3	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-												
D	680-242668-1	01/04/24	01/18/24	4	0	-	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-	1	0												
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	1	0	1	0	-	-	-	-	-	-												
F	680-242837-2	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-												
G	680-242974-2	01/04/24	01/18/24	1	0	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-												
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-	1	0	-	-												
Total	TR/PG			41	0	1	0	1	0	1	0	1	0	1	0	1	0	39	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	104

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		CN- (9012B)		NO_3 /NO_2-N (353.2)		pH (9040C)		Total Phenols (9066)		SO_4 (9056A)		S= (9034)		TSS (2540D)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	3	0	-	-	3	0	-	-	-	-	3	0	-	-	-	-	3	0														
B	680-242109-1	01/04/24	01/18/24	13	0	-	-	13	0	-	-	-	-	13	0	13	0	-	-	13	0														
D	680-242668-1	01/04/24	01/18/24	1	0	-	-	1	0	-	-	-	-	1	0	1	0	-	-	1	0														
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-														
G	680-242974-2	01/04/24	01/18/24																																
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-														
Total	TR/PG			17	0	1	0	17	0	1	0	1	0	17	0	14	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-242837-1

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023
SDG:	680-242837-1
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	February 21, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	E624	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9040C
DCL LEACHATE-FAL23	680-242837-1	Liquid	Field Sample/N	X	X	X	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-242837-1. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 50 results (65.79%) out of the 76 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

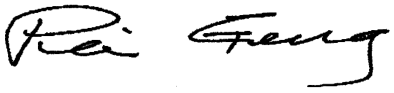
Narrative Comments

Analytical Method	Data Reviewer Comment
E624	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9040C	No additional comments; see Checklist for detail.

February 21, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

February 28, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method E624, Test Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of analysis found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL23 (N)		15.4	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Test Hold Time for E624

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1,2,2-Tetrachloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1,2-Trichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1-Dichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1-Dichloroethene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dibromoethane (EDB)	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloroethene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloropropane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,3-Dichlorobenzene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,4-Dichlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	2-Butanone (MEK)	15.0	12.0 U H	12.0 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	2-Hexanone	5.00	4.00 U H	4.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	4-Methyl-2-pentanone (MIBK)	5.00	3.20 U H	3.20 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Acetone	15.0	8.00 U H	8.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Benzene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromodichloromethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromoform	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromomethane	5.00	4.00 U H	4.00 UJ		ug/l	H1

Qualified Results associated with the Test Hold Time for E624

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	Carbon disulfide	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Carbon Tetrachloride	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chlorobenzene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloroethane	4.00	1.60 U H	1.60 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloroform	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	cis-1,2-Dichloroethene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	cis-1,3-Dichloropropene	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Dibromochloromethane	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Dichlorodifluoromethane	3.00	2.50 U H	2.50 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Ethylbenzene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	m,p-Xylene	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Methyl tert-butyl ether (MTBE)	5.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Methylene chloride	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	o-Xylene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Styrene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Tetrachloroethene (PCE)	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Toluene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	trans-1,2-Dichloroethene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	trans-1,3-Dichloropropene	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Trichloroethene (TCE)	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Trichlorofluoromethane	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Xylenes, Total	1.00	0.800 U H	0.800 UJ		ug/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS6808085723 (CV)	Dieldrin	78.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV)	Endosulfan sulfate	75.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV)	Endrin ketone	77.0	80 - 120	80 - 120	percent	J/X	V2	
CCVIS6808085723 (CV)	p,p'-DDE	67.0	80 - 120	80 - 120	percent	J/X	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	Dieldrin	0.0520	0.00690 J	0.00690 J	-	ug/l	TR/V2
DCL LEACHATE-FAL23 680-242837-1	N	Endosulfan sulfate	0.0520	0.00420 U	0.00420 UJ		ug/l	V2
DCL LEACHATE-FAL23 680-242837-1	N	Endrin ketone	0.0520	0.0170 U	0.0170 UJ		ug/l	V2
DCL LEACHATE-FAL23 680-242837-1	N	p,p'-DDE	0.0520	0.00420 U	0.00420 UJ		ug/l	V1/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: E624		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	1,1,1-Trichloroethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1,2,2-Tetrachloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1,2-Trichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1-Dichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,1-Dichloroethene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dibromoethane (EDB)	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloroethane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloroethene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,2-Dichloropropane	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,3-Dichlorobenzene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	1,4-Dichlorobenzene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	2-Butanone (MEK)	15.0	12.0 U H	12.0 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	2-Hexanone	5.00	4.00 U H	4.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	4-Methyl-2-pentanone (MIBK)	5.00	3.20 U H	3.20 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Acetone	15.0	8.00 U H	8.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Benzene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromodichloromethane	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromoform	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Bromomethane	5.00	4.00 U H	4.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Carbon disulfide	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Carbon Tetrachloride	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chlorobenzene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloroethane	4.00	1.60 U H	1.60 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloroform	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Chloromethane	2.00	1.00 U H	1.00 UJ		ug/l	H1

Table of All Qualified Results

Test Method: E624		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	cis-1,2-Dichloroethene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	cis-1,3-Dichloropropene	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Dibromochloromethane	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Dichlorodifluoromethane	3.00	2.50 U H	2.50 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Ethylbenzene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	m,p-Xylene	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Methyl tert-butyl ether (MTBE)	5.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Methylene chloride	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	o-Xylene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Styrene	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Tetrachloroethene (PCE)	1.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Toluene	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	trans-1,2-Dichloroethene	1.00	0.500 U H	0.500 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	trans-1,3-Dichloropropene	2.00	1.80 U H	1.80 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Trichloroethene (TCE)	1.00	0.400 U H	0.400 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Trichlorofluoromethane	2.00	0.800 U H	0.800 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Vinyl chloride	2.00	1.00 U H	1.00 UJ		ug/l	H1
DCL LEACHATE-FAL23 680-242837-1	N	Xylenes, Total	1.00	0.800 U H	0.800 UJ		ug/l	H1

Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0520	0.00830 J	0.00830 J		ug/l	P1/TR
DCL LEACHATE-FAL23 680-242837-1	N	alpha-Endosulfan	0.0520	0.00420 U	0.00420 UJ		ug/l	V1
DCL LEACHATE-FAL23 680-242837-1	N	Dieldrin	0.0520	0.00690 J	0.00690 J	-	ug/l	TR/V2
DCL LEACHATE-FAL23 680-242837-1	N	Endosulfan sulfate	0.0520	0.00420 U	0.00420 UJ		ug/l	V2
DCL LEACHATE-FAL23 680-242837-1	N	Endrin ketone	0.0520	0.0170 U	0.0170 UJ		ug/l	V2

Table of All Qualified Results

Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	p,p'-DDE	0.0520	0.00420 U	0.00420 UJ		ug/l	V1/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8081B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
DCL LEACHATE-FAL23 680-242837-1	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0520	0.00830 J	0.00830 J	TR	0.00830 J	P1/TR
DCL LEACHATE-FAL23 680-242837-1	N	alpha-Endosulfan	0.0520	0.00420 U	0.00420 U		0.00420 UJ	V1
DCL LEACHATE-FAL23 680-242837-1	N	Endosulfan sulfate	0.0520	0.00420 U	0.00420 X	V2	0.00420 UJ	V2
DCL LEACHATE-FAL23 680-242837-1	N	Endrin ketone	0.0520	0.0170 U	0.0170 X	V2	0.0170 UJ	V2
DCL LEACHATE-FAL23 680-242837-1	N	p,p'-DDE	0.0520	0.00420 U	0.00420 X	V2	0.00420 UJ	V1/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
H1	Test Hold Time
P1	Column RPD
TR	Trace Level Detect
V1	ICV
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: E624 (Volatile Organics GC/MS)

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Several results qualified UJ due to being analyzed outside of the 14 day holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		Several results qualified J-(detects) or UJ(non-detects) due to CCV%D > 20%. One result qualified J due to difference in column RPD > 40%.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?		•		Several results qualified UJ due to ICV %D > 20%.
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW9040C (pH Electrometric Measurement)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?			•	Not applicable to this method.
Were target analytes in the ICBs/CCBs non-detect?			•	Not applicable to this method.
Was a method blank prepared and analyzed with each batch?			•	Not applicable to this method.
Were target analytes in the method blank less than MDL?			•	Not applicable to this method.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 28, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 4, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58331_F:

SDG #	**Fraction**
680-242837-2	Polychlorinated Biphenyls

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

341 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		VOA (624)		SVOA (625)		Pest. (8081B)		PCBs (8082A)		Metals (6010C /6020A)		Hg (7470A)		3 D.Met. (6010C /6020A)		DRO (8015C)		Methane Ethane Ethene													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	3	0												
B	680-242109-1	01/04/24	01/18/24	25	0	-	-	-	-	-	-	-	-	-	-	-	-	23	0	-	-	13	0												
C	680-242433-1	01/04/24	01/18/24	3	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-												
D	680-242668-1	01/04/24	01/18/24	4	0	-	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-	1	0												
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	1	0	1	0	-	-	-	-	-	-												
F	680-242837-2	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-												
G	680-242974-2	01/04/24	01/18/24	1	0	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-												
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-	1	0	-	-												
Total	TR/PG			41	0	1	0	1	0	1	0	1	0	1	0	1	0	39	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	104

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		CN- (9012B)		NO_3 /NO_2-N (353.2)		pH (9040C)		Total Phenols (9066)		SO_4 (9056A)		S= (9034)		TSS (2540D)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	3	0	-	-	3	0	-	-	-	-	3	0	-	-	-	-	3	0														
B	680-242109-1	01/04/24	01/18/24	13	0	-	-	13	0	-	-	-	-	13	0	13	0	-	-	13	0														
D	680-242668-1	01/04/24	01/18/24	1	0	-	-	1	0	-	-	-	-	1	0	1	0	-	-	1	0														
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-														
G	680-242974-2	01/04/24	01/18/24																																
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-														
Total	TR/PG			17	0	1	0	17	0	1	0	1	0	17	0	14	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-242837-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023
SDG:	680-242837-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	February 21, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW8082A
DCL LEACHATE-FAL23	680-242837-1	Liquid	Field Sample/N	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-242837-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 2 results (28.57%) out of the 7 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW8082A	No additional comments; see Checklist for detail.

February 21, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

February 28, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW8082A, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68080856935 (CV)	PCB-1260 (Aroclor 1260)	130	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Table of All Qualified Results

Test Method: SW8082A		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL23 680-242837-1	N	PCB-1221 (Aroclor 1221)	0.520	0.250 U	0.250 UJ		ug/l	V2
DCL LEACHATE-FAL23 680-242837-1	N	PCB-1254 (Aroclor 1254)	0.520	0.250 U	0.250 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8082A

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
DCL LEACHATE-FAL23 680-242837-1	N	PCB-1221 (Aroclor 1221)	0.520	0.250 U	0.250 U		0.250 UJ	V2
DCL LEACHATE-FAL23 680-242837-1	N	PCB-1254 (Aroclor 1254)	0.520	0.250 U	0.250 U		0.250 UJ	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 680-242837-2

Review Questions

Method: SW8082A (Polychlorinated Biphenyls (PCB))

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		Several results qualified UJ due to CCV%D > 20%.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 28, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 4, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58331_H:

SDG #	Fraction
680-243143-1	Semivolatiles, Wet Chemistry, Diesel Range Organics

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

341 pages-ADV

Attachment 1

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		VOA (624)		SVOA (625)		Pest. (8081B)		PCBs (8082A)		Metals (6010C /6020A)		Hg (7470A)		3 D.Met. (6010C /6020A)		DRO (8015C)		Methane Ethane Ethene													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	3	0												
B	680-242109-1	01/04/24	01/18/24	25	0	-	-	-	-	-	-	-	-	-	-	-	-	23	0	-	-	13	0												
C	680-242433-1	01/04/24	01/18/24	3	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-												
D	680-242668-1	01/04/24	01/18/24	4	0	-	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-	1	0												
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	1	0	1	0	-	-	-	-	-	-												
F	680-242837-2	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-												
G	680-242974-2	01/04/24	01/18/24	1	0	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-												
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-	1	0	-	-												
Total	TR/PG			41	0	1	0	1	0	1	0	1	0	1	0	1	0	39	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	104

Stage 2B EQUIS EDD

LDC# 58331 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		CN- (9012B)		NO_3 /NO_2-N (353.2)		pH (9040C)		Total Phenols (9066)		SO_4 (9056A)		S= (9034)		TSS (2540D)		TOC (9060A)													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-241926-1	01/04/24	01/18/24	3	0	-	-	3	0	-	-	-	-	3	0	-	-	-	-	3	0														
B	680-242109-1	01/04/24	01/18/24	13	0	-	-	13	0	-	-	-	-	13	0	13	0	-	-	13	0														
D	680-242668-1	01/04/24	01/18/24	1	0	-	-	1	0	-	-	-	-	1	0	1	0	-	-	1	0														
E	680-242837-1	01/04/24	01/18/24	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-														
G	680-242974-2	01/04/24	01/18/24																																
H	680-243143-1	01/04/24	01/18/24	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-														
Total	TR/PG			17	0	1	0	17	0	1	0	1	0	17	0	14	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-243143-1

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2023
SDG:	680-243143-1
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	February 21, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2540D	E625	M8015D	SW9065
DCL Leachate-Fal23	680-243143-1	Liquid	Field Sample/N	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-243143-1. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 53 results (96.36%) out of the 55 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
A2540D	Laboratory duplicate RPD greater than RPD limit of 5 but the difference was less than 2x the LOQ so no results were qualified.
E625	No additional comments; see Checklist for detail.
M8015D	No additional comments; see Checklist for detail.
SW9065	No additional comments; see Checklist for detail.

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc. — February 21, 2024

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc. — February 28, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method E625, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS2806351342A (BS)	2-Chloronaphthalene	122	60 - 118	10 - 118	percent	J/None	C	
LCS2806351342A (BS)	Dimethyl phthalate	113	10 - 112	10 - 112	percent	J/None	C	
LCS2806351342A (BS)	Hexachlorocyclopentadiene	113	10 - 68	10 - 68	percent	J/None	C	
LCS2806351342A (BS)	N-Nitrosodiphenylamine	120	46 - 114	10 - 114	percent	J/None	C	
LCS2806351342A (BS)	Pyrene	120	55 - 115	10 - 115	percent	J/None	C	
LCSD2806351343A (BD)	2-Chloronaphthalene	127	60 - 118	10 - 118	percent	J/None	C	
LCSD2806351343A (BD)	Benzidine	72.0	5 - 65	10 - 65	percent	J/None	C	
LCSD2806351343A (BD)	Hexachlorocyclopentadiene	123	10 - 68	10 - 68	percent	J/None	C	
LCSD2806351343A (BD)	N-Nitrosodiphenylamine	117	46 - 114	10 - 114	percent	J/None	C	
LCSD2806351343A (BD)	Pyrene	121	55 - 115	10 - 115	percent	J/None	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method E625, LCS RPD

The objective of laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. LCS/LCSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Laboratory control sample/laboratory control sample duplicate RPD results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCSD2806351343A (BD)	Benzidine	63.8	< 50	< 50	rpd	J/None	Z	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method E625, Prep Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of extraction found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL23 (N)		13.1	< 7	< 14	days	J/UJ	H2	Prep Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	1,2,4-Trichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,2-Dichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,3-Dichlorobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,4-Dichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2,2'-Oxybis(1-chloropropane)	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2,4,6-Trichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dimethylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Chloronaphthalene	3.80	3.10 U H Q	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2-Chlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Nitrophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	3,3'-Dichlorobenzidine	48.0	29.0 U H	29.0 UJ		ug/l	H2/V2
DCL Leachate-Fal23 680-243143-1	N	4,6-Dinitro-2-methylphenol	48.0	29.0 U H	29.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Bromophenyl phenyl ether	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	4-Chloro-3-methylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Chlorophenyl phenyl ether	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	4-Nitrophenol	9.50	8.40 U H	8.40 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Acenaphthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Acenaphthylene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Anthracene	3.80	3.10 U H	3.10 UJ		ug/l	H2

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	Benzidine	95.0	95.0 U H Q	95.0 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(a)anthracene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(a)pyrene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(b)fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(g,h,i)perylene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(k)fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzyl butyl phthalate	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-chloroethoxy)methane	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-chloroethyl) ether (2-Chloroethyl ether)	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-ethylhexyl)phthalate	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Chrysene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Dibenz(a,h)anthracene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Diethyl phthalate	3.80	0.950 U H	0.950 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Dimethyl phthalate	3.80	3.10 U M H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	di-n-Butyl phthalate	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	di-n-Octyl phthalate	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Fluorene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorobutadiene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorocyclopentadiene	48.0	29.0 U H Q	29.0 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachloroethane	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Indeno(1,2,3-c,d)pyrene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Isophorone	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Naphthalene	3.80	1.90 U H	1.90 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Nitrobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	N-Nitrosodi-n-propylamine	9.50	7.60 U H	7.60 UJ		ug/l	H2

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	N-Nitrosodiphenylamine	9.50	7.60 U H Q	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Pentachlorophenol	48.0	38.0 U H	38.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Phenanthrene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Phenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Pyrene	9.50	7.60 U H Q	7.60 UJ		ug/l	H2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method E625, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL23 (N)	Phenol-d5	21.0	36 - 120	27 - 120	percent	J/X	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	2,4,6-Trichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dimethylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Chlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Nitrophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4,6-Dinitro-2-methylphenol	48.0	29.0 U H	29.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Chloro-3-methylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Nitrophenol	9.50	8.40 U H	8.40 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Pentachlorophenol	48.0	38.0 U H	38.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Phenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Quality Control Outliers for test method M8015D, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6808091672A (BS)	C10-C28 Petroleum Hydrocarbons	63.0	78 - 122	78 - 113	percent	J/X	C	
LCSD6808091673A (BD)	C10-C28 Petroleum Hydrocarbons	51.0	78 - 122	78 - 113	percent	J/X	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Quality Control Outliers for test method M8015D, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL23 (N)	o-Terphenyl	51.0	69 - 133	10 - 133	percent	J/UJ	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for M8015D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.220 J	0.220 J	-	mg/l	I/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: E625		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	1,2,4-Trichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,2-Dichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,3-Dichlorobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	1,4-Dichlorobenzene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2,2'-Oxybis(1-chloropropane)	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2,4,6-Trichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dichlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dimethylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Chloronaphthalene	3.80	3.10 U H Q	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	2-Chlorophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Nitrophenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	3,3'-Dichlorobenzidine	48.0	29.0 U H	29.0 UJ		ug/l	H2/V2
DCL Leachate-Fal23 680-243143-1	N	4,6-Dinitro-2-methylphenol	48.0	29.0 U H	29.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Bromophenyl phenyl ether	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	4-Chloro-3-methylphenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Chlorophenyl phenyl ether	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	4-Nitrophenol	9.50	8.40 U H	8.40 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Acenaphthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Acenaphthylene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Anthracene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzidine	95.0	95.0 U H Q	95.0 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(a)anthracene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(a)pyrene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(b)fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(g,h,i)perylene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Benzo(k)fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2

Table of All Qualified Results

Test Method: E625		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	Benzyl butyl phthalate	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-chloroethoxy)methane	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-chloroethyl) ether (2-Chloroethyl ether)	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Bis(2-ethylhexyl)phthalate	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Chrysene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Dibenz(a,h)anthracene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Diethyl phthalate	3.80	0.950 U H	0.950 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Dimethyl phthalate	3.80	3.10 U M H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	di-n-Butyl phthalate	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	di-n-Octyl phthalate	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Fluoranthene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Fluorene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorobutadiene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachlorocyclopentadiene	48.0	29.0 U H Q	29.0 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Hexachloroethane	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Indeno(1,2,3-c,d)pyrene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Isophorone	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Naphthalene	3.80	1.90 U H	1.90 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Nitrobenzene	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	N-Nitrosodi-n-propylamine	9.50	7.60 U H	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	N-Nitrosodiphenylamine	9.50	7.60 U H Q	7.60 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Pentachlorophenol	48.0	38.0 U H	38.0 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Phenanthrene	3.80	3.10 U H	3.10 UJ		ug/l	H2
DCL Leachate-Fal23 680-243143-1	N	Phenol	9.50	7.60 U H	7.60 UJ		ug/l	H2/I
DCL Leachate-Fal23 680-243143-1	N	Pyrene	9.50	7.60 U H Q	7.60 UJ		ug/l	H2

Table of All Qualified Results

Test Method: M8015D		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL Leachate-Fal23 680-243143-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.220 J	0.220 J	-	mg/l	I/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method E625

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
DCL Leachate-Fal23 680-243143-1	N	2,4,6-Trichlorophenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dichlorophenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	2,4-Dimethylphenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Chlorophenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	2-Nitrophenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	3,3'-Dichlorobenzidine	48.0	29.0 U H	29.0 UJ	H2	29.0 UJ	H2/V2
DCL Leachate-Fal23 680-243143-1	N	4,6-Dinitro-2-methylphenol	48.0	29.0 U H	29.0 X	H2/I	29.0 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Chloro-3-methylphenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	4-Nitrophenol	9.50	8.40 U H	8.40 X	H2/I	8.40 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	Pentachlorophenol	48.0	38.0 U H	38.0 X	H2/I	38.0 UJ	H2/I
DCL Leachate-Fal23 680-243143-1	N	Phenol	9.50	7.60 U H	7.60 X	H2/I	7.60 UJ	H2/I

Modified Qualifiers for test method M8015D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
DCL Leachate-Fal23 680-243143-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.220 J	0.220 J	C/I/TR	0.220 J	I/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
C	LCS Recovery
H2	Prep Hold Time
I	Surrogate recovery outside project limits.
TR	Trace Level Detect
V2	CCV
Z	LCS RPD

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.

NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high
Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result	

Review Questions

Method: A2540D (Total Suspended Solids Dried at 103-105 C)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: E625 (Extractable Priority Pollutants (Base/Neutral and Acid))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Results qualified UJ due to analysis outside of 14 day holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		Results qualified UJ due to CCV%D > 20%.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?		•		Results qualified UJ due to surrogate %R below %R limits.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		LCS/LCSD %R greater than %R limits but no results were qualified.
Was the LCS/LCSD RPD within project acceptance limits?		•		LCS/LCSD RPD greater than RPD limits but no results were qualified.
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: M8015D (Modified SW8015 for the Determination of Diesel Range Organics in Soil and Water, GC/FID)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?		•		Results qualified J- due to surrogate %R below %R limits.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			Lab limits follow QAPP of DOD QSM5.3 of %R 36-132, so no results were qualified.
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW9065 (Phenolics (Spectrophotometric, Manual 4-AAP with Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Results qualified UJ due to MS/MSD %R below %R limits.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

March 27, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on March 18, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58599_B:

SDG #	**Fraction**
680-242928-2/SQ6350	Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

163 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58599 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		(4) Met. (6010C /6020A)		4 D.Met. (6010C /6020A)		Fe,Mn (6010C)		Mn (6010C)		VPH (MADEP -VPH		Alk (2320B)		COD (410.4)		CN- (9012B)															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-242926-1	03/18/24	04/08/24	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2	0														
B	680-242928-2/SQ6350	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	1	0	3	0	2	0	-	-	-	-														
C	680-242934-2/SQ6351	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	-	-	3	0	2	0	-	-	-	-														
D	680-242974-3	03/18/24	04/08/24	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-														
Total	TR/PG			2	0	2	0	1	0	1	0	4	0	1	0	6	0	4	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

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Data Validation Report for 680-242928-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023
SDG:	680-242928-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	March 26, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C
AAFES-2-FAL23	680-242928-6	Water	Field Sample/N	X	X
AAFES-7-FAL23	680-242928-9	Water	Field Sample/N		X
XGM-94-04X-FAL23	680-242928-17	Water	Field Sample/N	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-242928-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 7 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.

March 26, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 26, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.

UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high
Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result	

Data Validation Report for 680-242928-2

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 680-242928-2

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for SQ6350

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023
SDG:	SQ6350
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Katahdin Analytical Services, Scarborough, ME
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	March 26, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP
AAFES-2-FAL23	SQ6350-2	Water	Field Sample/N	X
AAFES-2-FAL23	SQ6350-2DL	Water	Field Sample/N	X
XGM-94-04X-FAL23	SQ6350-9	Water	Field Sample/N	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Katahdin Analytical Services, Scarborough, ME and were reported under sample delivery group (SDG) SQ6350. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 20 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPVP	No additional comments; see Checklist for detail.

March 26, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 26, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.

U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high
Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result	

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

March 27, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on March 18, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58599_C:

SDG #	**Fraction**
680-242934-2/SQ6351	Metals, Wet Chemistry, Volatile Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

163 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58599 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		(4) Met. (6010C /6020A)		4 D.Met. (6010C /6020A)		Fe,Mn (6010C)		Mn (6010C)		VPH (MADEP -VPH		Alk (2320B)		COD (410.4)		CN- (9012B)															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-242926-1	03/18/24	04/08/24	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2	0														
B	680-242928-2/SQ6350	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	1	0	3	0	2	0	-	-	-	-														
C	680-242934-2/SQ6351	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	-	-	3	0	2	0	-	-	-	-														
D	680-242974-3	03/18/24	04/08/24	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-														
Total	TR/PG			2	0	2	0	1	0	1	0	4	0	1	0	6	0	4	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

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Data Validation Report for 680-242934-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023
SDG:	680-242934-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	March 26, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	SW6010C
XGM-93-02X-FAL23	680-242934-1	Water	Field Sample/N	X	X
XGM-97-12X-FAL23	680-242934-2	Water	Field Sample/N	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-242934-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 6 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.

March 26, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 26, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6010C, Total, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB68080877158 (CB) CCB68080877158	Iron	19.4	< 17	< 100	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
B2	CCB
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 680-242934-2

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?				
Were samples preserved properly and received in good condition?				
Were holding times met?				
Were all requested target analytes reported?				
Was the Calibration within acceptance criteria?				
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?				
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Analyte detected in the CCB but no results were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for SQ6351

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2023
SDG:	SQ6351
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Katahdin Analytical Services, Westbrook, ME
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	March 26, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP
XGM-93-02X-FAL23	SQ6351-1	Water	Field Sample/N	X
XGM-97-12X-FAL23	SQ6351-2	Water	Field Sample/N	X
XGM-97-12X-FAL23	SQ6351-2DL	Water	Field Sample/N	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Katahdin Analytical Services, Westbrook, ME and were reported under sample delivery group (SDG) SQ6351. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 20 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPVP	No additional comments; see Checklist for detail.

March 26, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 26, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.

U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias	
-	The result may be biased low
+	The result may be biased high
Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result	

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

March 27, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on March 18, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58599_D:

SDG #	**Fraction**
680-242974-3	Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

163 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58599 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		(4) Met. (6010C /6020A)		4 D.Met. (6010C /6020A)		Fe,Mn (6010C)		Mn (6010C)		VPH (MADEP -VPH		Alk (2320B)		COD (410.4)		CN- (9012B)															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-242926-1	03/18/24	04/08/24	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2	0														
B	680-242928-2/SQ6350	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	1	0	3	0	2	0	-	-	-	-														
C	680-242934-2/SQ6351	03/18/24	04/08/24	-	-	-	-	-	-	-	-	2	0	-	-	3	0	2	0	-	-	-	-														
D	680-242974-3	03/18/24	04/08/24	-	-	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-														
Total	TR/PG			2	0	2	0	1	0	1	0	4	0	1	0	6	0	4	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Arcadis\Fort Devens\58599ST.wpd

Data Validation Report for 680-242974-3

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Supplemental Remedial Investigation, AOC 43G, Fall 2023
SDG:	680-242974-3
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	March 26, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C	SW6010C - Dissolved	SW6020A	SW6020A - Dissolved
AOC43G-DUP01-FAL23	680-242974-11	Water	Field Duplicate/FD	X	X	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-242974-3. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 8 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.

March 26, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

March 26, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6010C, Dissolved, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB6808085231A (LB) MB6808085231A	Manganese	1.62	< 1.3	< 10	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Quality Control Outliers for test method SW6010C, Total, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB680808771138 (CB) CCB680808771138	Manganese	1.15	< 1	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
B2	CCB
L	Lab Blank
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Analyte detected in the CB but no results were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Analyte detected in the method blank but no results were qualified.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

April 4, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on April 4, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58660_A:

SDG #	**Fraction**
680-243065-2	Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

33 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58660 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	3 D.Met. (6010C /6020A)		4 D.Met. (6010C /6020A)																															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-243065-2	04/04/24	04/25/24	2	0	-	-																																
B	680-243142-2	04/04/24	04/25/24	-	-	2	0																																
Total	TR/PG			2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-243065-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2023
SDG:	680-243065-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 04, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C - Dissolved	SW6020A - Dissolved
69W-94-14-FAL23	680-243065-2	Water	Field Sample/N	X	X
ZWM-95-15X-FAL23	680-243065-3	Water	Field Sample/N	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-243065-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (16.67%) out of the 6 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.

April 04, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 04, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB680809393370 (CB) CCB680809393370	Manganese	2.06	< 1	< 10	ug/l	U/None*	B2	
CCB680809393382 (CB) CCB680809393382	Manganese	1.64	< 1	< 10	ug/l	U/None*	B2	
CCB680809393394 (CB) CCB680809393394	Iron	23.3	< 17	< 100	ug/l	U/None*	B2	
CCB680809393394 (CB) CCB680809393394	Manganese	2.50	< 1	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

Qualified Results associated with the Calibration Blank for SW6010C, Dissolved

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
69W-94-14-FAL23 680-243065-2	N	Iron	100	43.0 J	100 U		ug/l	B2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: SW6010C		Extraction Method: FLDFLT						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
69W-94-14-FAL23 680-243065-2	N	Iron	100	43.0 J	100 U		ug/l	B2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
B2	CCB
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Result qualified U at the LOQ due to CCB detect.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

April 4, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on April 4, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58660_B:

SDG #	**Fraction**
680-243142-2	Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

33 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD	LDC# 58660 (Arcadis - Millersville, MD / Fort Devens)																																				
LDC	SDG#	DATE REC'D	(2) DATE DUE	3 D.Met. (6010C /6020A)		4 D.Met. (6010C /6020A)																															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-243065-2	04/04/24	04/25/24	2	0	-	-																														
B	680-243142-2	04/04/24	04/25/24	-	-	2	0																														
Total	TR/PG			2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 680-243142-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2023
SDG:	680-243142-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 04, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C - Dissolved	SW6020A - Dissolved
69W-94-13-FAL23	680-243142-1	Water	Field Sample/N	X	X
ZWM-99-24X-FAL23	680-243142-3	Water	Field Sample/N	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-243142-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 6 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.

April 04, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 04, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6010C, Dissolved, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB680809393370 (CB) CCB680809393370	Manganese	2.06	< 1	< 10	ug/l	U/None*	B2	
CCB680809393382 (CB) CCB680809393382	Manganese	1.64	< 1	< 10	ug/l	U/None*	B2	
CCB680809393394 (CB) CCB680809393394	Iron	23.3	< 17	< 100	ug/l	U/None*	B2	
CCB680809393394 (CB) CCB680809393394	Manganese	2.50	< 1	< 10	ug/l	U/None*	B2	
CCB680809393406 (CB) CCB680809393406	Iron	21.8	< 17	< 100	ug/l	U/None*	B2	
CCB680809393406 (CB) CCB680809393406	Manganese	2.23	< 1	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
B2	CCB
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Analytes detected in the CCB but no results were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

LABORATORY DATA CONSULTANTS, INC.
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ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

April 11, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on March 26, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58684_A:

SDG #	**Fraction**
680-243065-2	Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

55 pages-ADV 3 WEEK TAT

Attachment 1

Stage 2B EQUIS EDD

LDC# 58684 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	3 D.Met. (6010C /6020A)		EPH (MADEP -EPH)																															
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-243154-2	03/26/24	04/16/24	7	0	-	-																														
B	680-243266-2	03/26/24	04/16/24	-	-	7	0																														
Total	TR/PG			7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Arcadis\Fort Devens\58684ST.wpd

Data Validation Report for 680-243154-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2023
SDG:	680-243154-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 10, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C - Dissolved	SW6020A - Dissolved
69WP-08-01-FAL23	680-243154-4	Water	Field Sample/N	X	X
69WP-13-01-FAL23	680-243154-5	Water	Field Sample/N	X	
AOC69W-DUP03-FAL23	680-243154-6	Water	Field Duplicate/FD	X	X
ZWM-01-25X-FAL23	680-243154-7	Water	Field Sample/N	X	X
ZWM-95-18X-FAL23	680-243154-11	Water	Field Sample/N	X	X
ZWM-99-22X-FAL23	680-243154-12	Water	Field Sample/N	X	X
ZWM-99-23X-FAL23	680-243154-13	Water	Field Sample/N	X	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-243154-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (5.26%) out of the 19 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.

April 10, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 11, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Quality Control Outliers for test method SW6010C, Dissolved, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
ZWM-95-18X-FAL23 (MS) 680-243154-11	Manganese	82.0	90 - 114	10 - 125	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW6010C, Dissolved

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-95-18X-FAL23 680-243154-11	N	Manganese	10.0	61.0 J1	61.0 J	-	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Table of All Qualified Results

Test Method: SW6010C		**Extraction Method: FLDFLT**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-95-18X-FAL23 680-243154-11	N	Manganese	10.0	61.0 J1	61.0 J	-	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Result qualified J- due to MS/MSD R% below %R limits.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Field Duplicate Report By SDG
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2023
Field Duplicates for SDG: 680-243154-2

Location	Analysis
ZWM-99-22X	SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
ZWM-99-22X-FAL23 / AOC69W-DUP03-FAL23	680-243154-12 / 680-243154-6	Iron (FLDFLT)	11000	11000	100	0.00	30	OK	NA
ZWM-99-22X-FAL23 / AOC69W-DUP03-FAL23	680-243154-12 / 680-243154-6	Manganese (FLDFLT)	1000	1100	10.0	9.52	30	OK	NA

Location	Analysis
ZWM-99-22X	SW6020A

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
ZWM-99-22X-FAL23 / AOC69W-DUP03-FAL23	680-243154-12 / 680-243154-6	Arsenic (FLDFLT)	110	120	5.00	8.70	30	OK	NA

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

April 11, 2024

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on March 26, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #58684_B:

SDG #	**Fraction**
680-243266-2	Extractable Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

55 pages-ADV 3 WEEK TAT

Attachment 1

LDC	SDG#	DATE REC'D	(2) DATE DUE	3 D.Met. (6010C /6020A)		EPH (MADEP -EPH)																															
Stage 2B EQUIS EDD	**LDC# 58684 (Arcadis - Millersville, MD / Fort Devens)**																																				
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-243154-2	03/26/24	04/16/24	7	0	-	-																														
B	680-243266-2	03/26/24	04/16/24	-	-	7	0																														
Total	TR/PG			7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

V:\LOGIN\Arcadis\Fort Devens\58684ST.wpd

Data Validation Report for 680-243266-2

Facility:	Former Fort Devens, Long Term Monitoring
Event:	Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2023
SDG:	680-243266-2
Guidance Document:	Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor:	Seres - Arcadis SB Joint Venture, LLC, Charleston, SC
Project Manager:	Jennifer Singer
Contract Laboratory(ies):	Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA
Data Review Contractor:	Laboratory Data Consultants, Inc.
Data Review Level:	2B
Primary Data Reviewer:	Long Ngo, Environmental Scientist
Second Reviewer:	Pei Geng, Senior Scientist
Date Submitted:	April 10, 2024

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPEP
69W-94-13-FAL23	680-243266-1	Water	Field Sample/N	X
69W-94-14-FAL23	680-243266-2	Water	Field Sample/N	X
ZWM-01-25X-FAL23	680-243266-3	Water	Field Sample/N	X
ZWM-95-15X-FAL23	680-243266-4	Water	Field Sample/N	X
ZWM-99-22X-FAL23	680-243266-6	Water	Field Sample/N	X
ZWM-99-23X-FAL23	680-243266-7	Water	Field Sample/N	X
ZWM-99-24X-FAL23	680-243266-8	Water	Field Sample/N	X

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres - Arcadis SB Joint Venture, LLC, Charleston, SC; analyses were performed by Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, PA and were reported under sample delivery group (SDG) 680-243266-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 15 results (10.71%) out of the 140 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPEP	No additional comments; see Checklist for detail.

April 10, 2024

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

April 11, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

No Outliers were associated with this sample delivery group.

Table of All Qualified Results

Test Method: MADEPEP		**Extraction Method: SW3510C**						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
69W-94-13-FAL23 680-243266-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	9.40 J	9.40 J		ug/l	TR/Z
69W-94-14-FAL23 680-243266-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	47.0	9.80 J Q	9.80 J		ug/l	TR/Z
ZWM-01-25X-FAL23 680-243266-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	11.0 J Q	11.0 J		ug/l	TR/Z
ZWM-95-15X-FAL23 680-243266-4	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	13.0 J	13.0 J		ug/l	TR/Z
ZWM-95-15X-FAL23 680-243266-4	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	11.0 J Q	11.0 J		ug/l	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	2-Methylnaphthalene	1.90	2.20 M Q	2.20 J		ug/l	Z
ZWM-99-22X-FAL23 680-243266-6	N	Acenaphthene	1.90	1.20 J M Q	1.20 J		ug/l	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	Acenaphthylene	1.90	2.10 M Q	2.10 J		ug/l	Z
ZWM-99-22X-FAL23 680-243266-6	N	Anthracene	1.90	0.970 J M Q	0.970 J		ug/l	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	100	100 J		ug/l	Z

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-99-22X-FAL23 680-243266-6	N	Fluorene	1.90	1.40 J M Q	1.40 J		ug/l	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	Phenanthrene	1.90	0.720 J M Q	0.720 J		ug/l	TR/Z
ZWM-99-23X-FAL23 680-243266-7	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	42.0	23.0 J	23.0 J		ug/l	TR/Z
ZWM-99-23X-FAL23 680-243266-7	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	52.0	10.0 J Q	10.0 J		ug/l	TR/Z
ZWM-99-24X-FAL23 680-243266-8	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	13.0 J Q	13.0 J		ug/l	TR/Z

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Table of Results with Modified Qualifiers

Modified Qualifiers for test method MADEPEP

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	ADR Reason	Modified Result	Reason
69W-94-13-FAL23 680-243266-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	9.40 J	9.40 J	TR	9.40 J	TR/Z
69W-94-14-FAL23 680-243266-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	47.0	9.80 J Q	9.80 J	TR	9.80 J	TR/Z
ZWM-01-25X-FAL23 680-243266-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	49.0	11.0 J Q	11.0 J	TR	11.0 J	TR/Z
ZWM-95-15X-FAL23 680-243266-4	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	13.0 J	13.0 J	TR	13.0 J	TR/Z
ZWM-95-15X-FAL23 680-243266-4	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	11.0 J Q	11.0 J	TR	11.0 J	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	2-Methylnaphthalene	1.90	2.20 M Q	2.20		2.20 J	Z
ZWM-99-22X-FAL23 680-243266-6	N	Acenaphthene	1.90	1.20 J M Q	1.20 J	TR	1.20 J	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	Acenaphthylene	1.90	2.10 M Q	2.10		2.10 J	Z
ZWM-99-22X-FAL23 680-243266-6	N	Anthracene	1.90	0.970 J M Q	0.970 J	TR	0.970 J	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	38.0	100	100		100 J	Z
ZWM-99-22X-FAL23 680-243266-6	N	Fluorene	1.90	1.40 J M Q	1.40 J	TR	1.40 J	TR/Z
ZWM-99-22X-FAL23 680-243266-6	N	Phenanthrene	1.90	0.720 J M Q	0.720 J	TR	0.720 J	TR/Z
ZWM-99-23X-FAL23 680-243266-7	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	42.0	23.0 J	23.0 J	TR	23.0 J	TR/Z
ZWM-99-23X-FAL23 680-243266-7	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	52.0	10.0 J Q	10.0 J	TR	10.0 J	TR/Z
ZWM-99-24X-FAL23 680-243266-8	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	48.0	13.0 J Q	13.0 J	TR	13.0 J	TR/Z

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect
Z	LCS RPD

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?		•		Several results qualified J due to LCS/LCSD RPD greater than RPD limits.
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Appendix D

Summary of Historical Groundwater Sampling Results

Appendix D
AOC 43G Exceedances Over Time, 1999 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Benzene- 5 µg/L Cleanup Goal																									
AAFES-2	**62**	**36**	**43**	**26**	**9.0**	**6.6**	**6.1**	1.3	ND	ND	3.93 J	ND	ND	**6.60 J**	**5.04**	3.7	4.2	ND	ND	ND	1.5 J	ND	ND	ND	1.5 J
XGM-93-02X	**81**	**32**	**12**	**140**	**24**	**39**	**29**	**18.5**	**8.8**	2.6	0.997 J	ND	ND	ND	ND	0.77 J	ND	ND	0.38 J	0.60 J	ND	ND	ND	ND	ND
XGM-97-12X	**270**	**550**	**700**	**780**	**290**	**260**	**35.6**	**129**	**22.8**	**13.7 J**	**27.4 J**	ND	**13.8**	3.03 J	3.87	1.5	3.8	ND	ND	4.0	ND	ND	ND	ND	**6.3**
Iron, total - 9,100 µg/L Cleanup Goal																									
AAFES-2	**24,000**	**20,000**	**27,000**	**26,000**	**14,000**	**20,000**	**21,900**	**12,000**	**20,000**	**18,000**	**16,000**	**14,000**	**22,000**	**18,000**	**19,000**	**19,400**	**14,400**	**11,000**	**10,000**	**19,000**	**20,000**	**17,000**	**17,000**	**14,000**	**16,000**
AAFES-6/6R	**11,000**	**9,200**	**13,000**	**9,400**	NS	NS	NS	**11,000**	**11,000**	6,500	4,300	3,300	1,100	6,900	**9,200**	8,240	NS	NS	NS	NS	NS	NS	NS	NS	NS
XGM-93-02X	**30,000**	**18,000**	**11,000**	**24,000**	**15,000**	**28,000**	**11,500**	**13,000**	5,800	**11,000**	8,500	**11,000**	**12,000**	6,000	**10,000**	**9,580**	**13,200**	**6,000**	**6,500**	**20,000**	**9,300**	6,400	6,200	4,400	7,100
XGM-94-07X	3,500	2,900	5,800	2,300	1,000	300	1,610	1,400	4,500	**9,300**	8,800	**12,000**	**13,000**	**23,000**	**10,000**	6,820	NS	NS	NS	NS	8,300	**12,000**	NS	NS	NS
XGM-94-08X	4,800	**13,000**	4,500	4,600	3,200	2,500	4,520	6,100	4,600	2,200	1,300	1,000	750	2,300	910	147	NS	NS	NS	NS	1,000	**11,000**	NS	NS	NS
XGM-97-12X	**32,000**	**26,000**	**33,000**	**46,000**	**33,000**	**32,000**	**20,100**	**18,000**	**22,000**	**25,000**	**25,000**	**16,000**	**27,000**	**20,000**	**24,000**	**25,800**	**34,300**	**25,000**	**18,000**	**27,000**	6,200	**18,000**	**28,000**	**16,000**	**37,000**
Manganese, total - 375 µg/L Cleanup Goal																									
AAFES-2	**4,600**	**3,900**	**4,800**	**3,700**	**3,100**	**4,000**	**3,590**	**2,700**	**3,790**	**3,600**	**3,320**	**2,490**	**3,700**	**3,100**	**3,270**	**3,460**	**2,740**	**2,800**	**2,800**	**3,100**	**3,500**	**3,200**	**2,500**	**2,600**	
AAFES-6/6R	**2,900**	**9,200**	**3,400**	**3,000**	NS	NS	NS	**2,900**	**3,090**	**3,630**	**907**	**1,670**	**1,830**	**3,220**	**2,820**	**3,000**	NS	NS	NS	NS	NS	NS	NS	NS	NS
AAFES-7	NS	NS	NS	NS	NS	NS	NS	NS	NS	106	81	79	5 J	**706**	**2,390**	**1,640**	139	**510**	330	NS	86	**3,400**	47	77	160
XGM-93-02X	**3,900**	**2,500**	**1,900**	**2,500**	**1,900**	**2,600**	**1,450**	**2,000**	**1,800**	**1,420**	**1,630**	**737**	**3,020**	**612**	**1,180**	**1,570**	**2,020**	**1,400**	**1,400**	**1,900**	**1,300**	**1,200**	**1,300**	**1,000**	**940**
XGM-94-04X	**2,900**	**2,200**	**3,400**	**2,000**	**1,400**	**1,400**	**1,580**	**1,100**	**559**	68	**2,730**	**6,490**	**2,140**	**2,580**	**2,730**	**1,510**	**1,090**	**1,500**	**1,700 J**	230	**5,500**	13	290	**5,600**	**440**
XGM-94-06X	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**1,400**	**1,800**	NS	NS	NS
XGM-94-07X	**5,700**	**3,700**	**6,100**	**4,500**	**3,600**	**1,000**	**6,120**	**5,100**	**4,120**	**5,100**	**4,990**	**3,870**	**6,060**	**5,560**	**5,380**	**6,940**	NS	NS	NS	NS	**4,200**	**4,500**	NS	NS	NS
XGM-94-08X	**4,500**	**4,600**	**4,900**	**3,600**	**3,600**	**3,800**	**7,260**	**4,200**	**3,380**	**3,100**	**2,150**	**2,070**	**2,780**	**4,620**	**2,300**	**3,210**	NS	NS	NS	NS	**3,500**	**7,100**	NS	NS	NS
XGM-97-12X	**6,300**	**4,100**	**4,200**	**3,900**	**4,100**	**3,000**	**437**	**1,800**	**2,070**	**3,060**	**2,390**	**2,110**	**3,540**	**1,640**	**1,680**	**2,080**	**3,460**	**1,700**	**1,200**	**3,800**	250	**1,300**	**1,700**	**1,100**	**2,000**
C_5-C_8 Aliphatics - 300 µg/L Monitoring Criteria																									
AAFES-2	ND	**1,400**	ND	**1,200**	**1,200**	ND	**2,070**	**1,430**	**1,400**	ND	ND	**859**	**1,270**	**1,560 J**	**1,390**	**1,250**	**728**	**850**	**890**	**480 J**	**1,200**	**480**	**750**	**610**	**510**
AAFES-6/6R	**370**	**420**	290	ND	NS	NS	NS	**305**	ND	ND	ND	114	ND	215	287	188	NS	NS	NS	NS	NS	NS	NS	NS	NS
XGM-93-02X	ND	**570**	270	**790**	**410**	ND	**788**	**519**	ND	ND	ND	124	ND	ND	65	268	101	94	79 J	84 J	210	150	130	110	ND
XGM-94-04X	ND	**420**	140	ND	ND	ND	ND	ND	ND	ND	ND	**533**	**765**	**497 J**	**1,140**	186	**65**	**480**	**360**	ND	**590**	ND	ND	260	52 J
XGM-97-12X	**970**	**1,300**	**1,100**	**1,100**	**1,100**	ND	**2,370**	**1,740**	**1,230**	ND	**4,050**	**644**	**367**	**507 J**	**494**	272	**515**	**420**	**350**	**360**	**350**	110	**480**	190	**470**
C_9-C_{12} Aliphatics - 700 µg/L Monitoring Criteria																									
AAFES-2	ND	81	ND	200	ND	57	**5,220**	**987**	**1,000**	**1,020**	**950**	**768**	**1,080**	542 J	**1,650**	688	85.7	430	530 J	330 J	**790**	**820**	**750**	**1,100**	**320**
XGM-93-02X	ND	39	ND	58	33	34	**1,570**	268	94	182	55.5	ND	85.1	ND	100	76.6	ND	56	78 J	ND	79 J	66 J	94 J	ND	ND
XGM-97-12X	96	ND	ND	130	ND	90	**7,310**	**1,340**	**1,080**	**2,210**	**1,450**	**922**	535	275 J	**724**	162	*718*	230	170 J	420 J	150 J	300	**1,400**	ND	360
C_9-C_{10} Aromatics - 200 µg/L Monitoring Criteria																									
AAFES-2	**9,400**	**7,200**	**5,300**	**13,000**	**6,600**	**6,700**	**3,130**	**3,710**	**2,420**	**2,120**	**2,660**	**1,870**	**1,050**	**1,090**	**1,940**	**1,090**	**827**	**730**	**1,100 J**	**990**	**1,400**	**820**	**580**	**530**	**430**
XGM-93-02X	**510**	**2,300**	**1,100**	**3,600**	**1,600**	**3,700**	**918**	**766**	**228**	**325**	110	73.4	ND	ND	ND	113	62.3	ND	ND	75 J	100	66.0 J	ND	ND	ND
XGM-94-04X	200	**570**	170	28	ND	ND	ND	ND	ND	ND	ND	**243**	**469**	**300 J**	**769**	76.8	ND	**320**	**410 J**	ND	**830**	ND	ND	190	62 J
XGM-97-12X	**4,500**	**5,500**	**5,400**	**7,500**	**8,700**	**7,400**	**3,810**	**4,010**	**4,220**	**5,260**	**4,110**	**2,470 J**	**463**	**367 J**	**840**	**253**	**1,560**	**340**	**430 J**	**1,000**	**340**	**300**	**1,000**	160	**520**

Notes:

100 = Above cleanup goal
100 = Above monitoring criteria

1. The cleanup goal for iron is the background level. The cleanup goal for manganese is a site-specific goal determined in 2008 (Long-Term Monitoring Plan Former Fort Devens Army Installation, HGL, 2008).
2. The VPH carbon ranges are not contaminants of concern and are evaluated against MCP GW-1 standards for comparison purposes. Benzene, ethylbenzene, xylenes, and toluene are not contaminants of concern but the cleanup goals are the Maximum Contaminant Levels.

Acronyms and Abbreviations:

µg/L = microgram per liter
AOC = Area of Contamination
B = Blank Qualified
J = Estimated result
MCP = Massachusetts Contingency Plan
ND = Non-detect
NS = not sampled
VPH = volatile petroleum hydrocarbons

Appendix D
AOC 69W Exceedances Over Time, 2000 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Spring 2000	Fall 2000	Spring 2001	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2007	Fall 2008	Fall 2010	Fall 2011
Arsenic, dissolved - 10 µg/L Cleanup Goal																	
69W-94-13	**54**	**110**	**85**	**150**	**52**	**130**	**35**	**69**	**27**	**88**	**56**	**60**	**69**	**142**	**73**	**127**	**120**
ZWM-95-15X	ND	7.9	ND	**22**	**36**	**40**	ND	**16**	7.7	**30**	ND	ND	ND	**16**	ND	**13**	**41**
ZWM-99-22X	150	130	230	**140**	**86**	**140**	**150**	**160**	**140**	**140**	**120**	**120**	**159**	**244**	**223**	**343**	**367**
ZWM-99-23X	**23**	**70**	**67**	**55**	**15**	ND	**27**	ND	**44**	**61**	**46**	**47**	**56**	**56**	**52**	**15**	**60**
ZWM-01-25X	NA	NA	NA	4.1 J	ND	ND	2.3 J	ND	ND	3.4 J	ND	ND	3 J	5	2.3 J	ND	**13**
Manganese, dissolved - 375 µg/L Monitoring Criteria																	
69WP-08-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	174	78	**2,190**
69W-94-13	**2,300**	**1,700**	**1,500**	**1,600**	**2,100**	**2,400**	**2,800**	**4,100**	**2,500**	**1,300**	**3,000**	**1,600**	**2,600**	**1,120**	**1,940**	**1,360**	**1,840**
ZWM-95-15X	28	**1,300**	25	100	**1,500**	**2,200**	**1,600**	**970**	**4,600**	**980**	**850**	130	**860**	**1,230**	**438**	**1,120**	**1,010**
ZWM-99-22X	**2,000**	**1,800**	**2,300**	**2,400**	**2,000**	**1,500**	**2,700**	**2,300**	**3,100**	**1,900**	**3,400**	**3,200**	**3,700**	**3,120**	**3,790**	**1,750**	**2,160**
ZWM-99-23X	**4,200**	**3,600**	**5,800**	**1,500**	**550**	**1,700**	**5,300**	**4,300**	**2,500**	**2,300**	**5,200**	**2,500**	**2,700**	**1,320**	**2,500**	**523**	**1,720**
ZWM-01-25X	NA	NA	NA	280	61	**1,000**	89	230	140	300	140	**490**	**1,400**	**3,210**	**1,320**	**1,490**	**2,820**
EPH C_{11}-C_{22} Aromatics - 200 µg/L Monitoring Criteria																	
69W-94-13	**690**	**1,400**	**720**	**790**	**1,900**	**290**	ND	160	ND	110	ND	ND	**209**	**311**	152	**339**	**242**
ZWM-99-22X	**2,500**	**1,400**	**2,100**	**370**	**620**	**210**	**380**	**330**	**270**	**400**	**320**	**280**	**627**	166	**356**	**209**	**327**
ZWM-99-23X	170	**520**	**200**	140	140	ND	ND	ND	ND	ND	ND	ND	174	107	80	ND	ND

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

Acronyms and Abbreviations:
µg/L = microgram per liter
AOC = Area of Contamination
EPH = extractable petroleum hydrocarbons
J = Estimated result
NA = Not analyzed
ND = non-detect

Appendix D
AOC 69W Exceedances Over Time, 2000 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Arsenic, dissolved - 10 µg/L Cleanup Goal												
69W-94-13	**115**	**73**	**101**	**120**	**76**	**24**	**35**	**70**	**32**	**19**	**15**	9.1
ZWM-95-15X	**23**	**17**	**30.2**	**19.3**	3.7	**10**	**18**	**17**	7.0	**22**	8.9	7.7
ZWM-99-22X	**299**	**233 J**	**172**	**125**	**150**	**190**	**150**	**150**	**130**	**140**	**170**	**110**
ZWM-99-23X	**29**	**27**	**19.5**	**13.9**	7.7	**17**	**39**	**24**	5.3	**32**	6.1	**23**
ZWM-01-25X	**19**	5	ND	ND	ND	4.5	NA	ND	2.9 J	ND	ND	1.1 J
Manganese, dissolved - 375 µg/L Monitoring Criteria												
69WP-08-01	**904**	237	64.5	78.4	79	33	35	**1,300**	360	**670**	**1,400**	370
69W-94-13	**1,400**	**1,730**	**1,940**	**2,050**	**2,600**	320	**1,600**	**1,600**	**970**	**880**	**590**	320
ZWM-95-15X	**1,580**	**1,280**	**900**	**843**	17	220	340	**690 J**	360	**2,100**	**790**	**380**
ZWM-99-22X	**1,120**	**998**	**1,280**	**1,440**	**960**	**1,200**	**1,500**	**1,100**	**910**	**1,300**	**850**	**1,000**
ZWM-99-23X	**500**	**556**	**533**	**749**	**590**	**1,800**	**1,600**	**770**	110	**1,500**	220	**1,300**
ZWM-01-25X	**2,540**	**1,570**	**435**	**859**	78	**590**	NA	**6,200**	**1,700**	**540**	**560**	
EPH C_{11}-C_{22} Aromatics - 200 µg/L Monitoring Criteria												
69W-94-13	**379**	**227**	**252**	175	**410**	ND	98	77 J	50 J	ND	ND	**570**
ZWM-99-22X	**308**	**286**	**332**	**354**	**210**	170	**230**	**220**	78 J	ND	ND	100
ZWM-99-23X	ND	ND	ND	ND	110	ND	130	ND	ND	ND	ND	23 J

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

Acronyms and Abbreviations:
µg/L = microgram per liter
AOC = Area of Contamination
EPH = extractable petroleum hydrocarbons
J = Estimated result
NA = Not analyzed
ND = non-detect

Appendix D
DCL Historical Groundwater Data, Well LFM-99-02B
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

LFM-99-02B	Units	Monitoring Criteria	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Spring 2007	Spring 2008	Fall 2008	Spring 2009	Fall 2009
Extractable Petroleum Hydrocarbons (EPH)														
Naphthalene	µg/L	140	1.0 U	5.1 U	2.4 U	2.1 U	10.0 U	0.400 U	0.2 U	0.46 U	0.412 U	0.430 U	10 U	NA
Pesticides														
Aldrin	µg/L	0.50	0.0064 U	0.0067 U	0.0076 U	0.0076 U	0.05 UJ	0.200 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.200 UJ	NA
Dieldrin	µg/L	0.10	0.013 U	0.0013 U	0.015 U	0.014 U	0.1 U	0.040 UJ	0.05 U	0.0435 U	0.043 UJ	0.042 UJ	0.040 UJ	NA
Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	µg/L	0.20	0.0064 U	0.0067 U	0.0076 U	0.0076 U	0.05 U	0.020 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.020 UJ	NA
Metals														
Arsenic, Total	µg/L	10	5.0 U	50.0 U	5.0 U	5.0 U	4.2 U	5.0 J	2.5 U	5.0 U	5.0 U	5.0 U	5 U	5 U
Chromium, Total	µg/L	100	28	1.7 J	0.96 J	1.07 J	12.0 U	NA	10.0 U	10.0 U	10 U	10 U	5 U	40
Iron, Total	µg/L	NS	NA	100 U	17 J	100 U	38.0 U	32 J	50.0 U	50.0 U	50 U	28 J	50 U	380
Lead, Total	µg/L	15	5.0 U	8.5 J	5.0 U	5.0 U	3.1	10 U	2.5 U	10.0 U	10 U	10 U	10 J	10 U
Manganese, Total	µg/L	NS	NA	2.4 J	1.5 J	12.7 J	5.2 J	10 U	10.0 U	1.1 J	10 U	10 U	10 U	9.1 J
General Chemistry														
Total Cyanide	mg/L	0.20	0.01 U	0.004 J	0.01 U	0.005 J	0.01 U	0.005 U	0.05 U	0.01 UJ	0.005 U	0.005 U	0.005 U	NA
Nitrate/Nitrite (as N)	mg/L	NS	0.21	1.4	0.66	0.796	0.36 J	0.64 U	0.45	0.5	0.43 J	1.9	0.92	NA
Chemical Oxygen Demand	mg/L	NS	170	50.0 U	15 J	50.0 U	20.0 U	20 U	10.0 U	20.0 U	20 U	12 J	20 U	NA

Acronyms and Abbreviations:
µg/L = microgram per liter
DCL = Devens Consolidation Landfill
J = Estimated result
mg/L = milligram per liter
NA = Not analyzed
ND = non-detect
NS = No Standard
Q = Qualifier
R = Data were rejected
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect

LFM-99-02B	Units	Monitoring Criteria	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
Extractable Petroleum Hydrocarbons (EPH)															
Naphthalene	µg/L	140	0.419 U	0.400 U	0.400 U	0.400 U	0.400 U	0.148 J	0.400 U	0.400 U	0.400 U	1.0 U	5.100 U	4.300 U	2.0 U
Pesticides															
Aldrin	µg/L	0.50	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.010 U	0.026 U	0.051 U	0.013 U
Dieldrin	µg/L	0.10	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.010 U	0.026 U	0.051 U	0.007 U
Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.130 U	0.530 U	0.16 U
gamma-BHC (Lindane)	µg/L	0.20	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.011 U	0.026 U	0.051 U	0.007 U
Metals															
Arsenic, Total	µg/L	10	5 U	5 U	5 U	2 J	5 U	5 U	5 U	5 U	3 U	3 U	2.0 U	4.0 U	3.0 U
Chromium, Total	µg/L	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5.0 U	10 U	4.0 U
Iron, Total	µg/L	NS	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	100 U	50 U
Lead, Total	µg/L	15	10 U	10 U	10 U	3 J	10 U	10 U	10 U	10 U	10 U	10 U	2.5 U	5.0 U	10 U
Manganese, Total	µg/L	NS	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.5 U	15 U	3.0 U
General Chemistry															
Total Cyanide	mg/L	0.20	0.0011 J	0.005 U	0.005 U	0.005 U	0.002 J	0.0020 J	0.005 U	0.005 U	0.0001 J	0.0041 U	0.0011 U	0.0082 J	0.005 U
Nitrate/Nitrite (as N)	mg/L	NS	0.41	0.54	0.43	0.76	0.22 U	0.49	0.069 J	0.51	0.52	0.36	0.390	0.630	0.60
Chemical Oxygen Demand	mg/L	NS	20	20 U	8 J	20 U	20 U	20 U	15 J	20 U	4.1 J	10 U	15 U	20 U	10 U

Acronyms and Abbreviations:
µg/L = microgram per liter
DCL = Devens Consolidation Landfill
J = Estimated result
mg/L = milligram per liter
NA = Not analyzed
ND = non-detect
NS = No Standard
Q = Qualifier
R = Data were rejected
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect

LFM-99-02B	Units	Monitoring Criteria	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022	Fall 2022
Extractable Petroleum Hydrocarbons (EPH)															
Naphthalene	µg/L	140	2.3 U	1.9 U	1.9 U	1.9 U	1.4 U	1.6 U	1.5 U	1.4 U	1.4 U	R	2.5 U	1.4 U	1.4 U
Pesticides															
Aldrin	µg/L	0.50	0.019 U	0.017 U	0.017 U	0.019 UJ	0.017 UJ	0.0086 UJ	0.0089 U	0.0086 UJ	0.003 U	0.0086 U	0.0073 U	0.0074 U	0.0037 U
Dieldrin	µg/L	0.10	0.010 U	0.0096 U	0.0096 U	0.0110 UJ	0.0096 UJ	0.0048 U	0.0049 U	0.0048 U	0.0018 U	0.0086 U	0.0048 U	0.0049 U	0.0037 U
Chlordane	µg/L	2.0	0.31 U	0.29 U	0.29 U	0.32 UJ	0.29 UJ	0.14 U	0.15 U	0.14 U	0.05 U	0.14 U	0.14 U	0.14 U	0.37 U
gamma-BHC (Lindane)	µg/L	0.20	0.010 U	0.0096 U	0.0096 U	0.0110 UJ	0.0096 UJ	0.0048 U	0.0049 U	0.0048 U	0.0017 U	0.0048 U	0.0048 U	0.0049 U	0.0037 U
Metals															
Arsenic, Total	µg/L	10	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Chromium, Total	µg/L	100	6.0 J	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	5.0 U	4.0 U
Iron, Total	µg/L	NS	28	50 U	75 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Lead, Total	µg/L	15	10 U	10 U	2.5 U	10 U	15 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U
Manganese, Total	µg/L	NS	2.0 J	3.0 U	5.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	5.0 U	5.0 J
General Chemistry															
Total Cyanide	mg/L	0.20	0.0082 J	0.005 U	0.005 U	0.0048 J	0.0044 J	0.005 U	0.0026 J	0.0027 J	0.0025	0.0045 J	0.005 U	0.0074 J	0.0064 J
Nitrate/Nitrite (as N)	mg/L	NS	0.630	0.47	0.78	0.60	0.69	0.28	0.55 J	0.47	0.38	1.0	0.48	0.38	0.53
Chemical Oxygen Demand	mg/L	NS	20 U	5.4 J	10 U	10 J	10 U	20 U	40 UJ	20 U	17 U	20 U	12 J	10 J	14 J

Acronyms and Abbreviations:
µg/L = microgram per liter
DCL = Devens Consolidation Landfill
J = Estimated result
mg/L = milligram per liter
NA = Not analyzed
ND = non-detect
NS = No Standard
Q = Qualifier
R = Data were rejected
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect

LFM-99-02B	Units	Monitoring Criteria	Spring 2023	Fall 2023
Extractable Petroleum Hydrocarbons (EPH)				
Naphthalene	µg/L	140	1.2 U	1.2 U
Pesticides				
Aldrin	µg/L	0.50	0.0039 U	0.004 U
Dieldrin	µg/L	0.10	0.0039 U	0.004 U
Chlordane	µg/L	2.0	0.39 U	0.40 U
gamma-BHC (Lindane)	µg/L	0.20	0.0039 U	0.004 U
Metals				
Arsenic, Total	µg/L	10	3.0 U	3.0 U
Chromium, Total	µg/L	100	4.0 U	4.0 U
Iron, Total	µg/L	NS	50 U	50 U
Lead, Total	µg/L	15	20 U	20 U
Manganese, Total	µg/L	NS	5.0 U	5.0 U
General Chemistry				
Total Cyanide	mg/L	0.20	0.0050 U	0.0050 U
Nitrate/Nitrite (as N)	mg/L	NS	0.26	0.25
Chemical Oxygen Demand	mg/L	NS	20 U	13 J

Acronyms and Abbreviations:
µg/L = microgram per liter
DCL = Devens Consolidation Landfill
J = Estimated result
mg/L = milligram per liter
NA = Not analyzed
ND = non-detect
NS = No Standard
Q = Qualifier
R = Data were rejected
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect

Appendix D
AOC 32/43A Exceedances Over Time, 2006 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Spring 2006	Fall 2006	Spring 2007	Fall 2007	Spring 2008	Fall 2008	Spring 2009	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013
Arsenic (Total) - 10 µg/L Cleanup Goal																
32M-01-18XBR	**30**	**15**	**51**	3.1 J	**38**	**34**	**51**	**18**	**18**	3.5 J	3.0 J	5.0	5.0	4.0 J	2.0 J	6.0
32M-01-14XOB	**59**	**49**	**45**	**69**	**50**	**70**	**66**	NS	**43**	NS	**62**	NS	**80**	NS	**58**	NS
Manganese (Total) - 3,500 µg/L Cleanup Goal																
32M-01-18XBR	**18,000**	**16,000**	**18,200**	**10,200**	**14,800**	**18,900**	**29,400**	**6,970**	2,360	**4,510**	2,300	1,150	**4,100**	1,540	270	137
32M-01-14XOB	2,800	3,200	1,500	3,420	2,760	**5,050**	**3,660**	NS	2,460	NS	1,740	NS	1,950	NS	1,650	NS
1,2-Dichlorobenzene - 600 µg/L Cleanup Goal																
32M-01-18XBR	**5,900**	**2,800**	**6,100**	**690**	**2,700**	**4,100**	**1,700**	**730**	300	570	340	260	**640 J**	340	7.46 J	7.30
1,3-Dichlorobenzene - 100 µg/L Cleanup Goal																
32M-01-18XBR	**750**	**360**	**850**	**120**	**450**	**580**	**270**	**150**	59	100	86	64	**120 J**	70	7.10 J	2.12 J
1,4-Dichlorobenzene - 5 µg/L Cleanup Goal																
32M-01-18XBR	**490**	**210 J**	**550**	**67**	**270**	**390**	**180**	**100**	**26**	**62**	**50**	**37**	**69**	**42**	1.2 J	1.1 J
32M-01-15XBR	ND	**5.5**	**0.78 J**	**5.1 J**	**7.9**	**5.7 J**	ND	ND	**0.55 J**	ND	ND	ND	ND	**0.33 J**	ND	ND
Chlorobenzene - 100 µg/L Monitoring Criteria																
32M-01-18XBR	**900**	**480**	**1,200**	**110**	**850**	**1,600**	**540**	**200**	88	**210**	78	49	**280**	82	0.88 J	0.97 J
VPH C_9- C_{10} Aromatics - 200 µg/L Monitoring Criteria																
32M-01-18XBR	**5,850**	**4,120**	**6,050**	**952**	**3,230**	**3,660**	**1,890**	**837**	**300**	**541**	**444**	**272**	**728**	**322**	ND	ND

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

* = Spring 2015 and 2016 metals results are for dissolved metals.

Acronyms and Abbreviations:
µg/L = microgram per liter
AOC = Area of Contamination
J = Estimated result
NA = Not analyzed
ND = non-detect
NS = not sampled
T/D = Total and dissolved metals results are reported for Spring 2017 results.
VPH = volatile petroleum hydrocarbons

Appendix D
AOC 32/43A Exceedances Over Time, 2006 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Spring 2014	Spring 2015*	Spring 2016*	Spring 2017 (T/D)	Spring 2018	Spring 2019	Fall 2019	Spring 2020	Spring 2021	Spring 2022	Spring 2023
Arsenic (Total) - 10 µg/L Cleanup Goal											
32M-01-18XBR	3.0 J	4.0	2.8 J	4.7/2.4 J	6.5	3.4	NS	8.8	2.2 J	2.3 J	2.5 J
32M-01-14XOB	**62**	**90**	**13**	**33**	**32**	**29**	NS	**31**	**56**	**29**	**12**
Manganese (Total) - 3,500 µg/L Cleanup Goal											
32M-01-18XBR	1,990	1,720	1,100	2,300 / 2,700	**8,400**	2,200 J	NS	**25,000**	**3,700**	1,700	1,300
32M-01-14XOB	2,550	3,390	1,800	2,900 / 2,900	2,700	2,200	NS	1,900	2,000	770	810
1,2-Dichlorobenzene - 600 µg/L Cleanup Goal											
32M-01-18XBR	598	407	340	390	**840**	250 J	NS	**1,500 J**	130	160	ND
1,3-Dichlorobenzene - 100 µg/L Cleanup Goal											
32M-01-18XBR	**106**	80	58	70	**150**	41 J	NS	**250 J**	24	27	ND
1,4-Dichlorobenzene - 5 µg/L Cleanup Goal											
32M-01-18XBR	**71**	**51**	**38**	**46**	**97**	**29 J**	NS	**170 J**	**18**	**18**	ND
32M-01-15XBR	ND	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS
Chlorobenzene - 100 µg/L Monitoring Criteria											
32M-01-18XBR	**131**	88	81	**170**	**440**	**180 J**	NS	**970 J**	**190**	**160**	ND
VPH C_9- C_{10} Aromatics - 200 µg/L Monitoring Criteria											
32M-01-18XBR	**730**	**360**	**450**	**410**	**760**	160 J	NS	**1,000 J**	120	**210**	ND

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

* = Spring 2015 and 2016 metals results are for dissolved metals.

Acronyms and Abbreviations:
µg/L = microgram per liter
AOC = Area of Contamination
J = Estimated result
NA = Not analyzed
ND = non-detect
NS = not sampled
T/D = Total and dissolved metals results are reported for Spring 2017 results.
VPH = volatile petroleum hydrocarbons

Appendix D
AOC 57 Area 3 Exceedances Over Time, 2003 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2006	Spring 2007	Fall 2007	Spring 2008	Spring 2009	Spring 2010	Spring 2011	Spring 2012
Groundwater														
Arsenic (Total) - 10 µg/L Cleanup Goal														
57M-95-03X	**36**	**44**	**230**	**25**	**13.6**	7.0	**49**	4.8	**51**	**23**	**21**	**23**	**58**	**36**
57M-96-11X	**270**	**240**	**120**	**161**	**215**	**163**	**171**	**166**	**193**	**160**	**163**	**148**	**190**	**192**
Surface Water														
Iron (Dissolved) - 1,000 µg/L Surface Water Benchmark														
57-SW-1	NA	NA	NA	NA	NA	600	**4,500**	520	**7,100**	**6,800**	**2,500**	240	**20,000**	**8,300**

Notes:

100 = Above cleanup goal and/or benchmark

Acronyms and Abbreviations:

µg/L = microgram per liter
AOC = Area of Contamination
J = Estimated result
NA = Not analyzed
ND = non-detect

Appendix D
AOC 57 Area 3 Exceedances Over Time, 2003 to 2023
2023 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Sample Location	Spring 2013	Spring 2014	Spring 2015	Spring 2016	Spring 2017	Spring 2018	Spring 2019	Spring 2020	Spring 2021	Spring 2022	Spring 2023
Groundwater											
Arsenic (Total) - 10 µg/L Cleanup Goal											
57M-95-03X	**60**	**60**	**38**	**31**	**27**	**42**	**15**	**42**	**25**	**26**	**13**
57M-96-11X	**181**	**160**	**284**	**290**	**180**	**180**	**100**	**300 J**	**470**	**280**	**20**
Surface Water											
Iron (Dissolved) - 1,000 µg/L Surface Water Benchmark											
57-SW-1	**10,000**	**10,000**	**4,140**	**19,000**	**21,000**	**4,000**	760	490	**12,000**	**1,900**	**4,900**

Notes:

100 = Above cleanup goal and/or benchmark

Acronyms and Abbreviations:

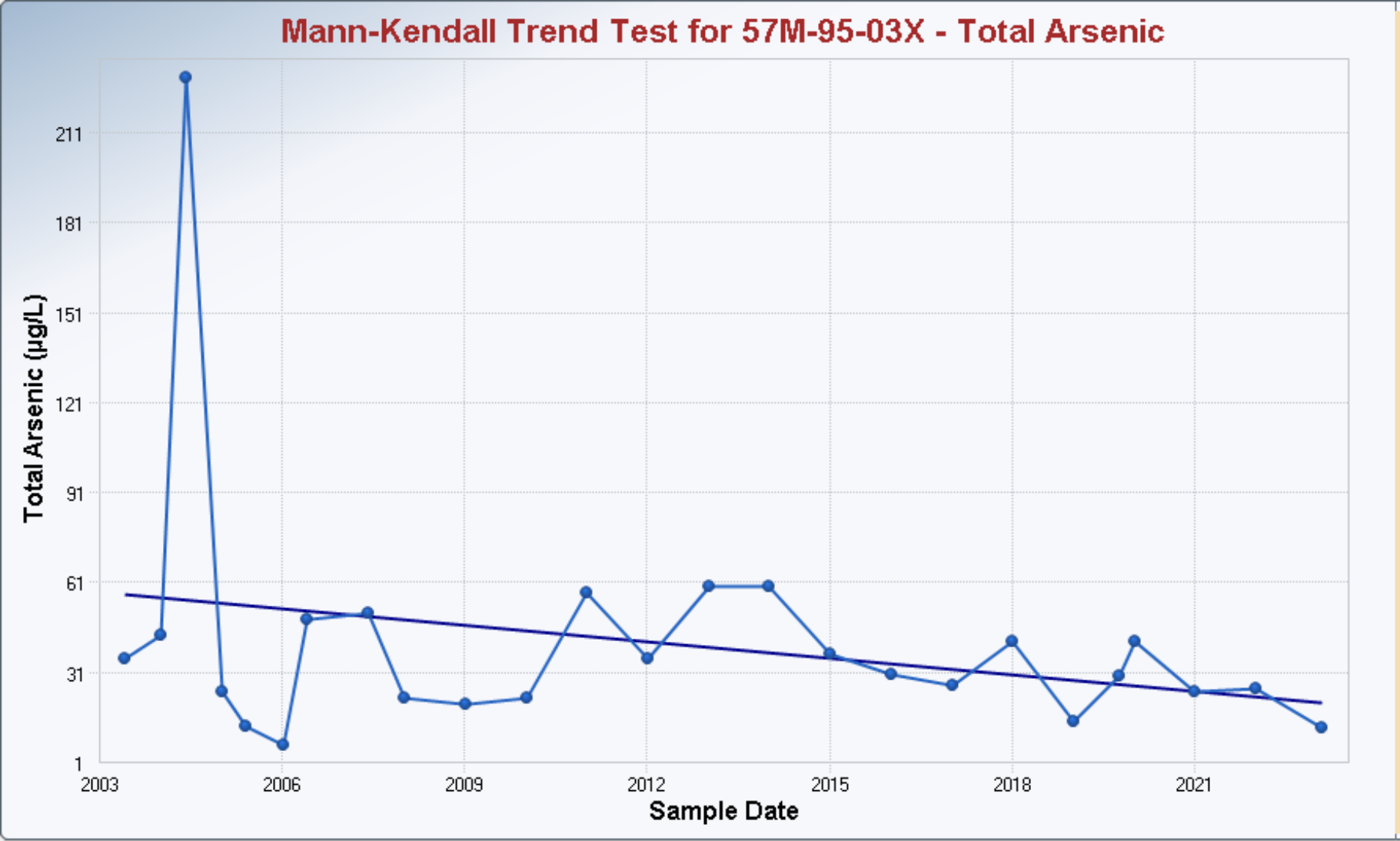
µg/L = microgram per liter
AOC = Area of Contamination
J = Estimated result
NA = Not analyzed
ND = non-detect

Appendix E

Mann-Kendall Data Trend Analyses

AOC 57

AOC 57
Total Arsenic



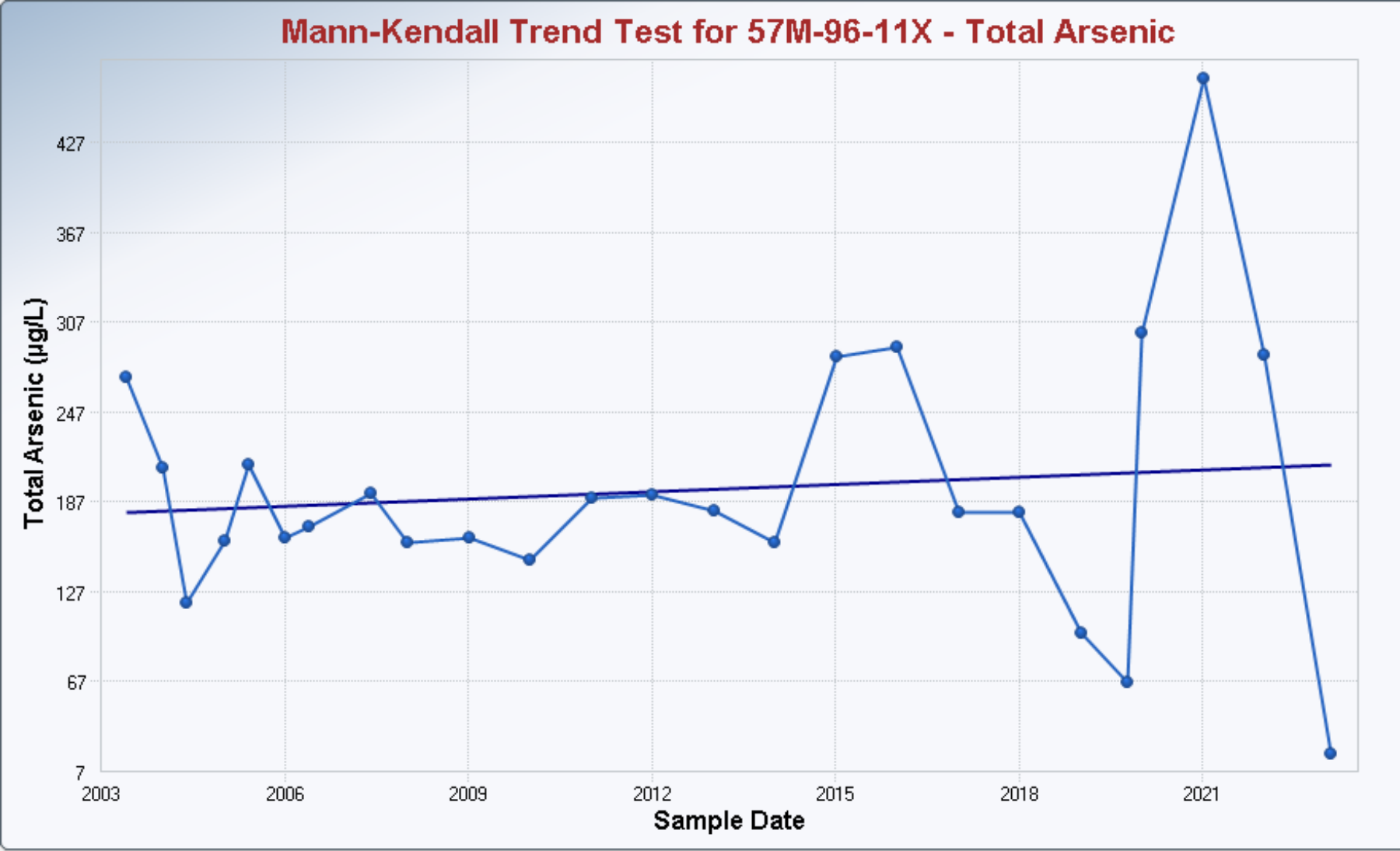
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7590
Standardized Value of S	-0.7952
M-K Test Value (S)	-35
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2133

OLS Regression Line (Blue)

OLS Regression Slope	-1.8349
OLS Regression Intercept	3,734.2268

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7824
Standardized Value of S	0.1402
M-K Test Value (S)	7
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4442

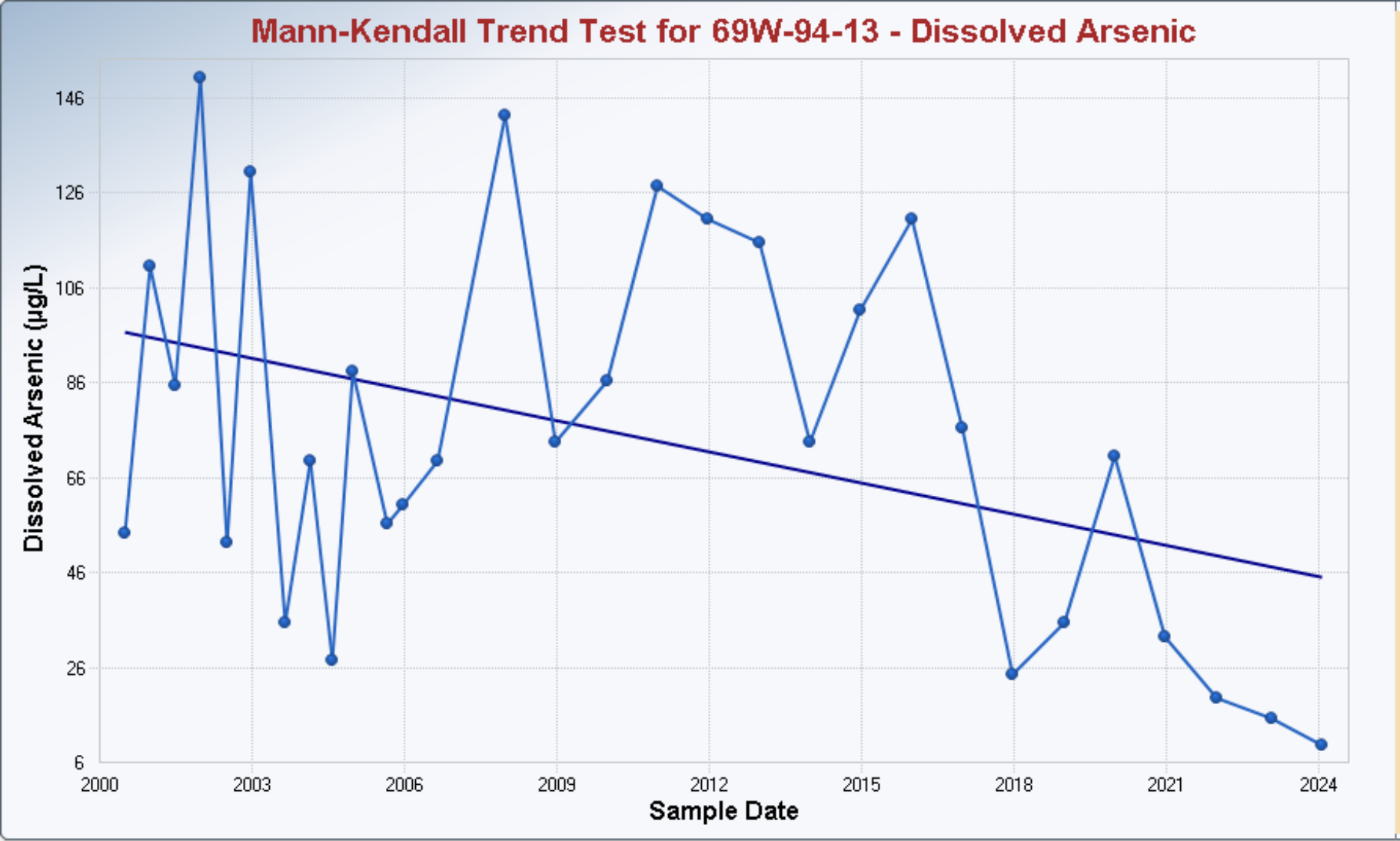
OLS Regression Line (Blue)

OLS Regression Slope	1.6511
OLS Regression Intercept	-3,128.5572

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOC 69W

AOC 69W
Dissolved Arsenic



Mann-Kendall Trend Analysis

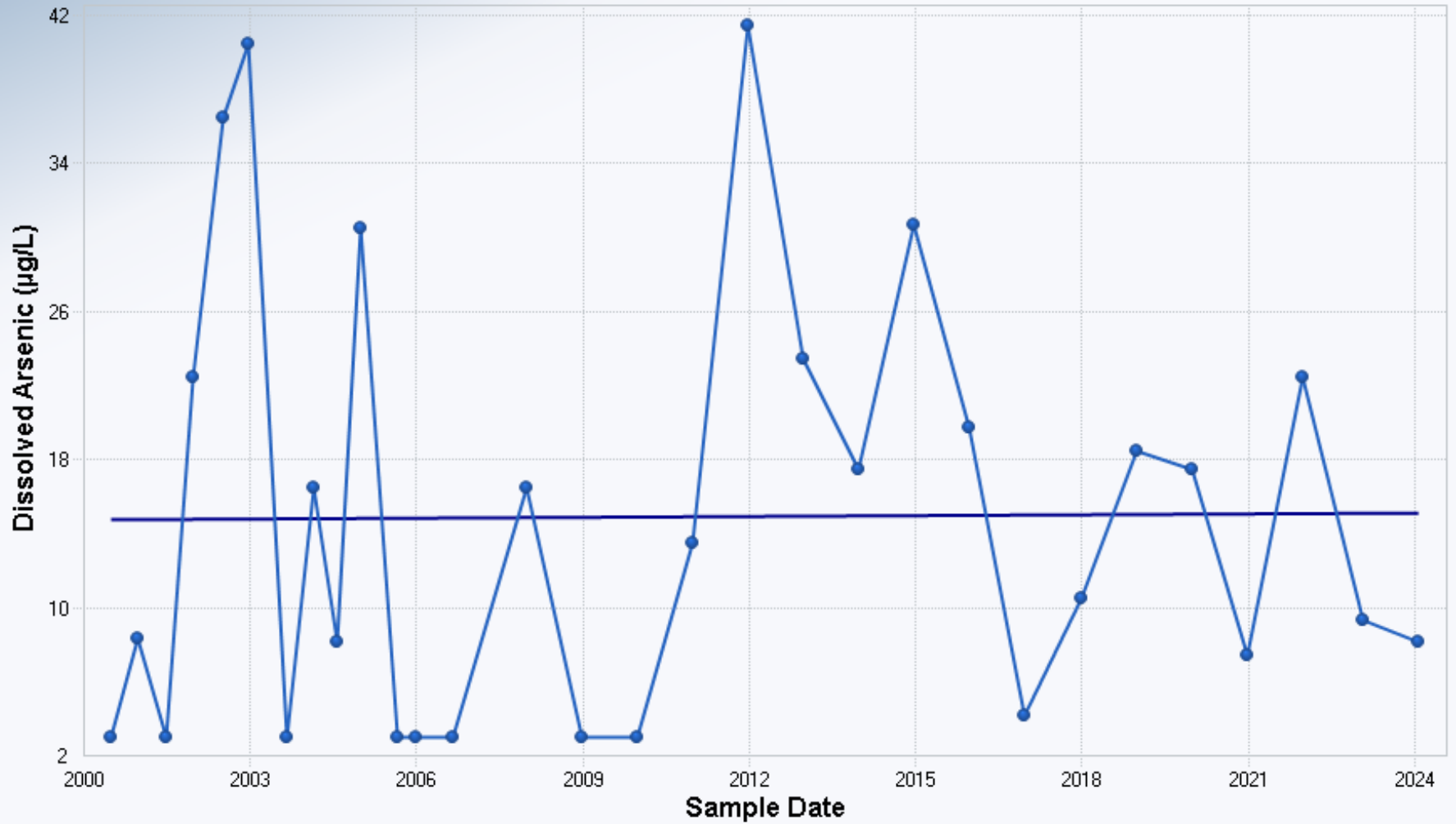
n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0149
Standardized Value of S	-1.8566
M-K Test Value (S)	-105
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0317

OLS Regression Line (Blue)

OLS Regression Slope	-2.1889
OLS Regression Intercept	4,474.7727

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-95-15X - Dissolved Arsenic



Mann-Kendall Trend Analysis

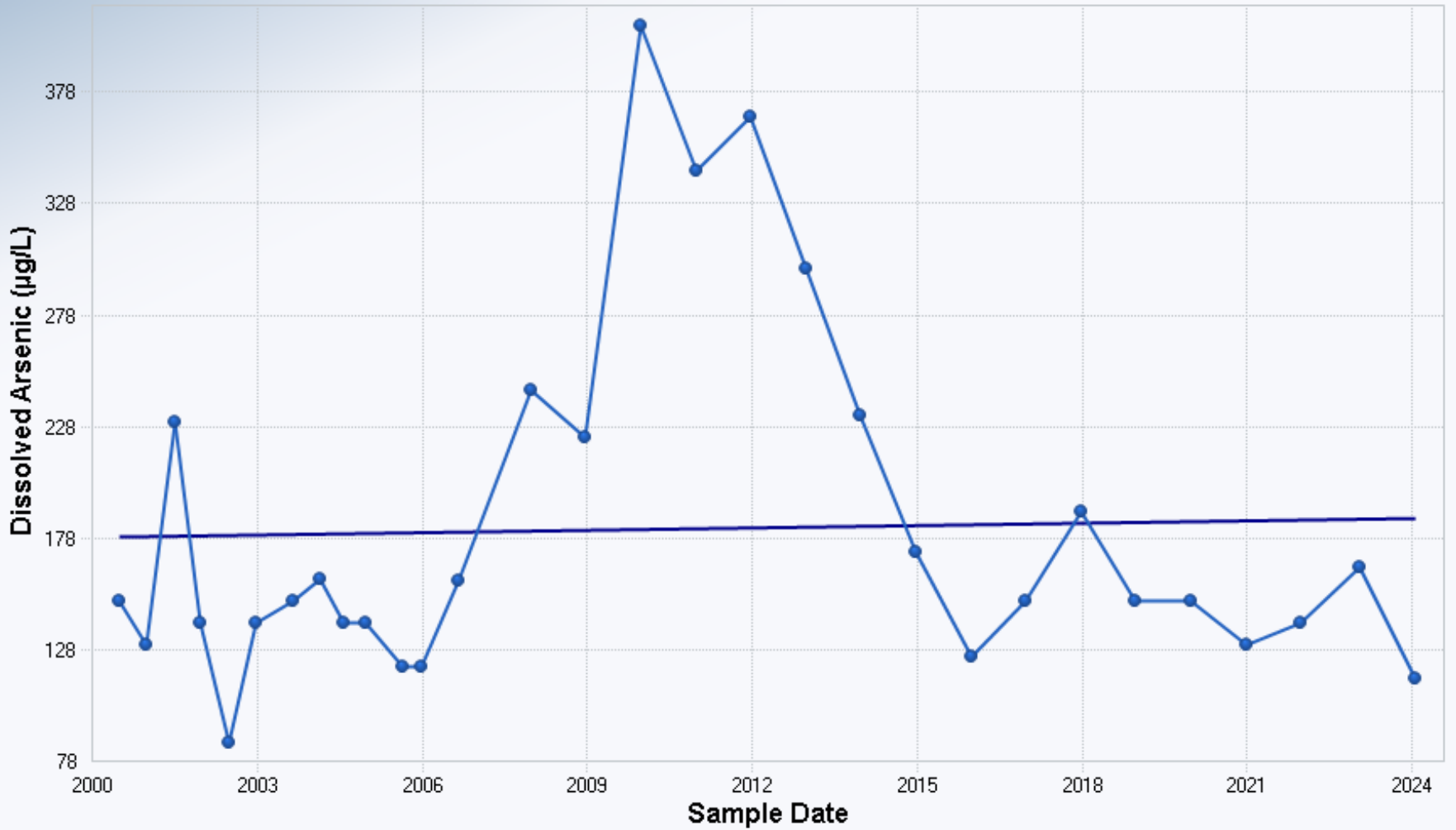
n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	55.4286
Standardized Value of S	0.6856
M-K Test Value (S)	39
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2465

OLS Regression Line (Blue)

OLS Regression Slope	0.0183
OLS Regression Intercept	-22.3726

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-22X - Dissolved Arsenic



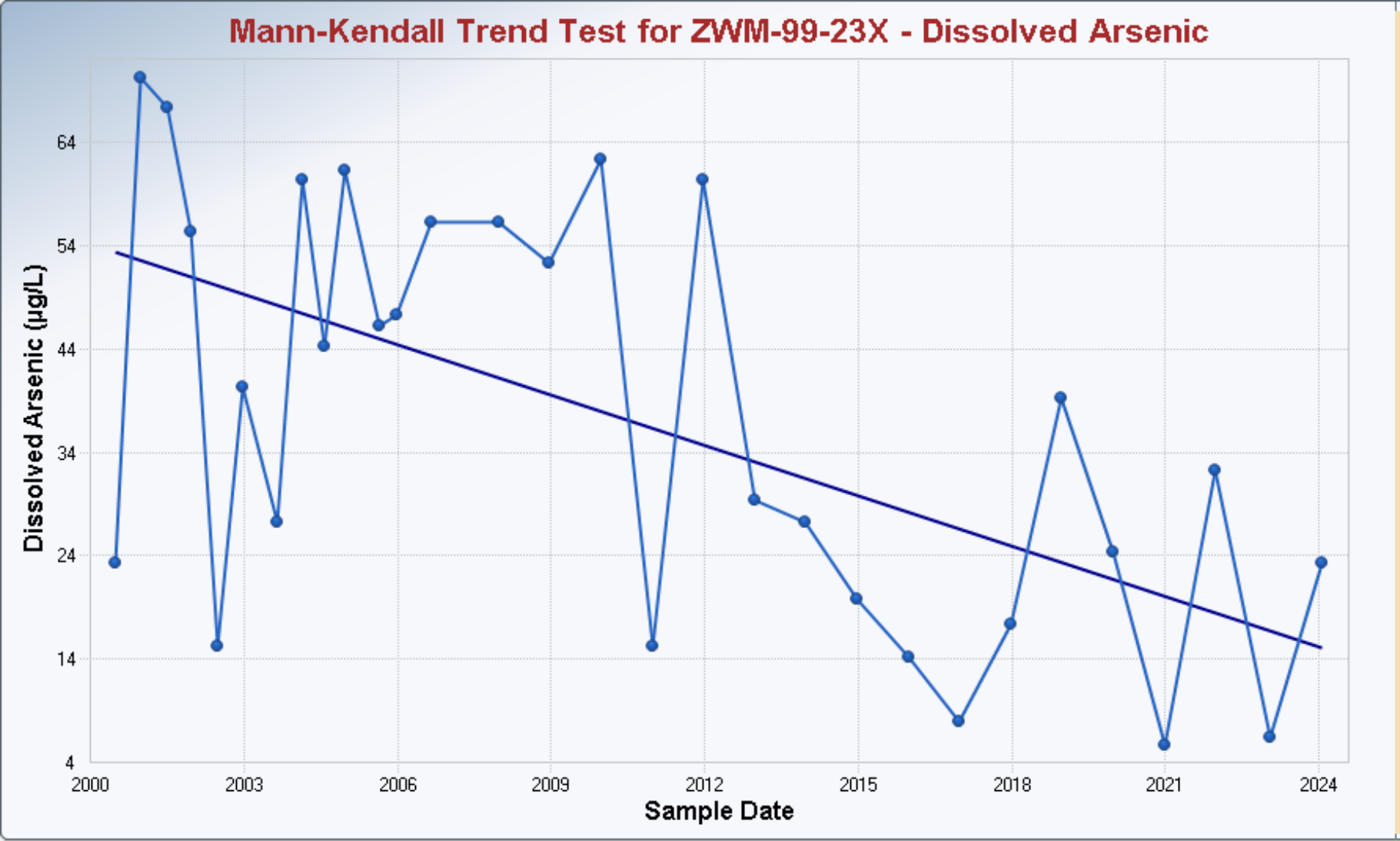
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	55.7345
Standardized Value of S	0.3588
M-K Test Value (S)	21
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3599

OLS Regression Line (Blue)

OLS Regression Slope	0.3665
OLS Regression Intercept	-554.4991

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0060
Standardized Value of S	-2.9104
M-K Test Value (S)	-164
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0018

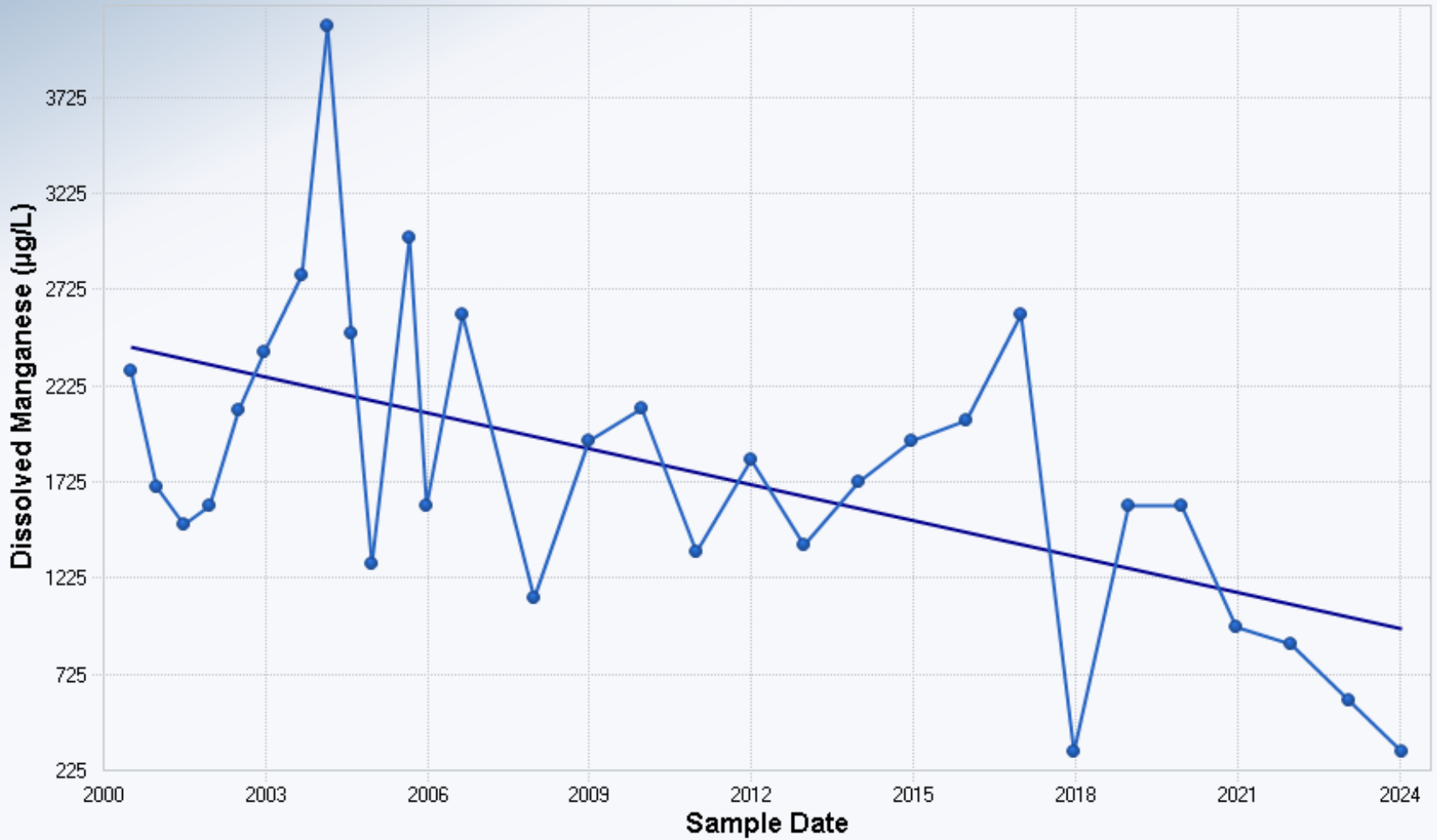
OLS Regression Line (Blue)

OLS Regression Slope	-1.6201
OLS Regression Intercept	3,293.6537

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 69W
Dissolved Manganese

Mann-Kendall Trend Test for 69W-94-13 - Dissolved Manganese



Mann-Kendall Trend Analysis

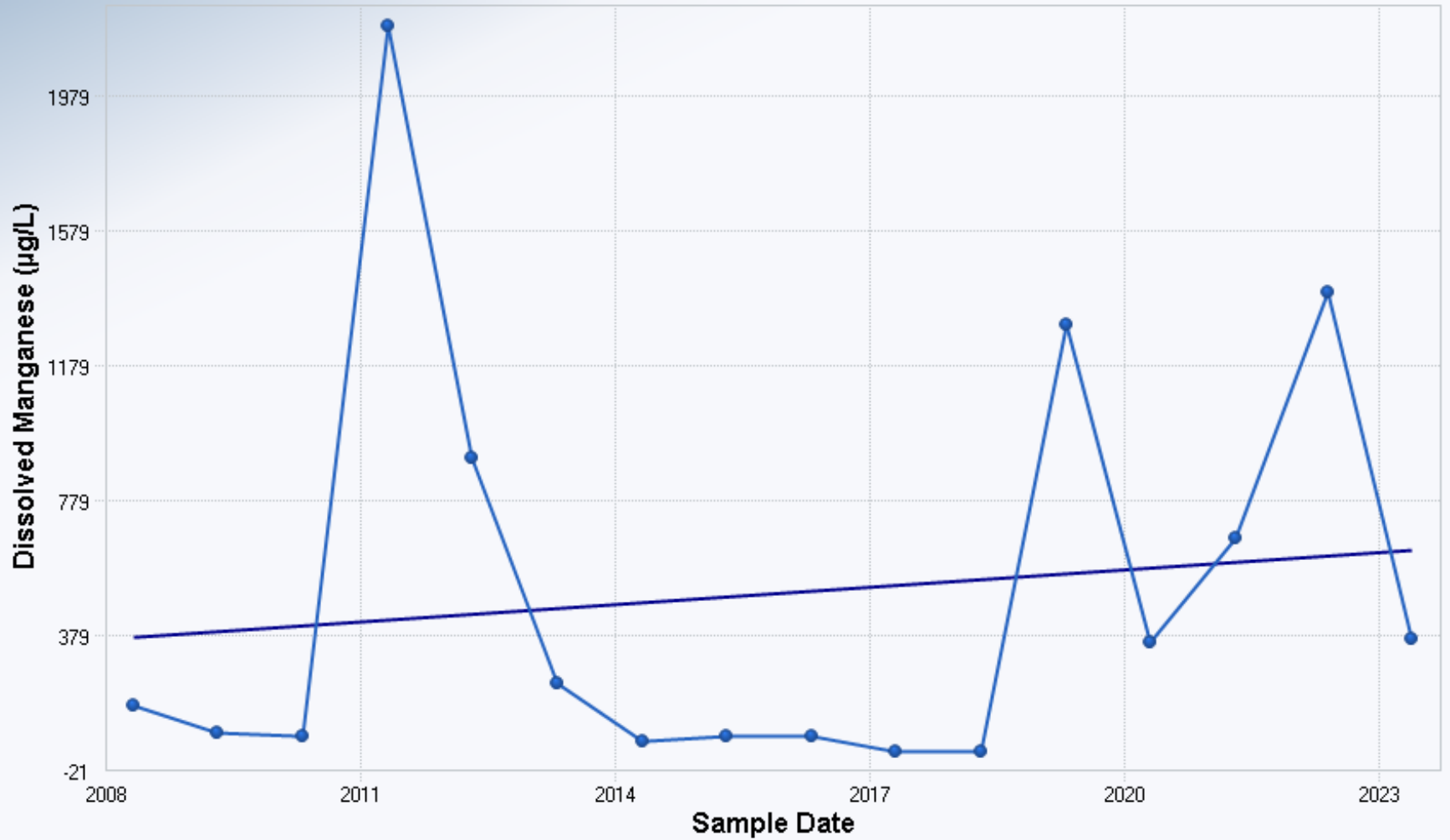
n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	55.9464
Standardized Value of S	-2.6990
M-K Test Value (S)	-152
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0035

OLS Regression Line (Blue)

OLS Regression Slope	-62.1992
OLS Regression Intercept	126,842.0743

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for 69WP-08-01 - Dissolved Manganese



Mann-Kendall Trend Analysis

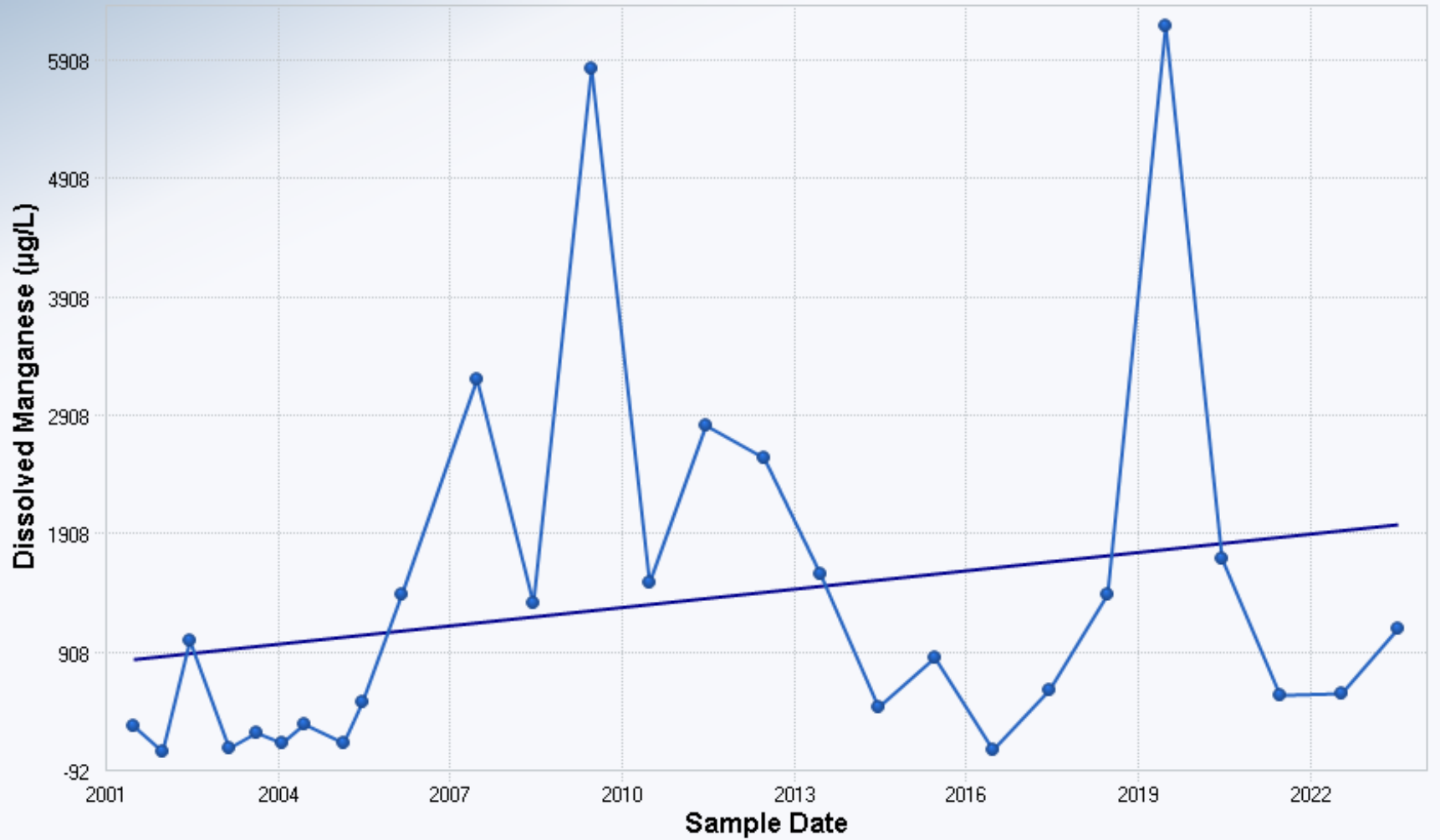
n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.2111
Standardized Value of S	0.5853
M-K Test Value (S)	14
Tabulated p-value	0.2820
Approximate p-value	0.2792

OLS Regression Line (Blue)

OLS Regression Slope	17.2608
OLS Regression Intercept	-34,299.2637

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-01-25X - Dissolved Manganese



Mann-Kendall Trend Analysis

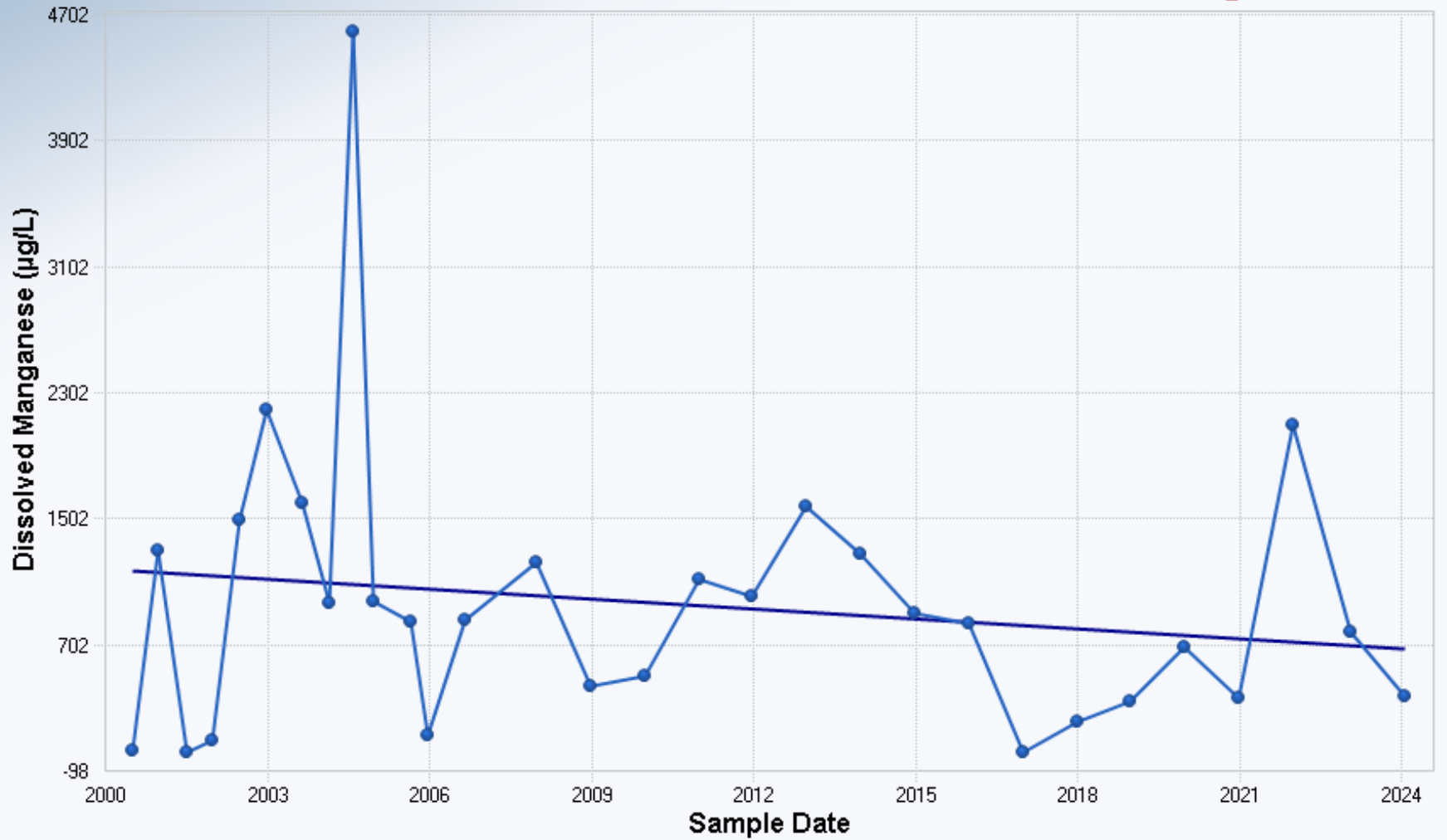
n	27
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.9479
Standardized Value of S	2.0856
M-K Test Value (S)	101
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0185

OLS Regression Line (Blue)

OLS Regression Slope	51.2491
OLS Regression Intercept	-101,739.6649

Statistically significant evidence of an increasing trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-95-15X - Dissolved Manganese



Mann-Kendall Trend Analysis

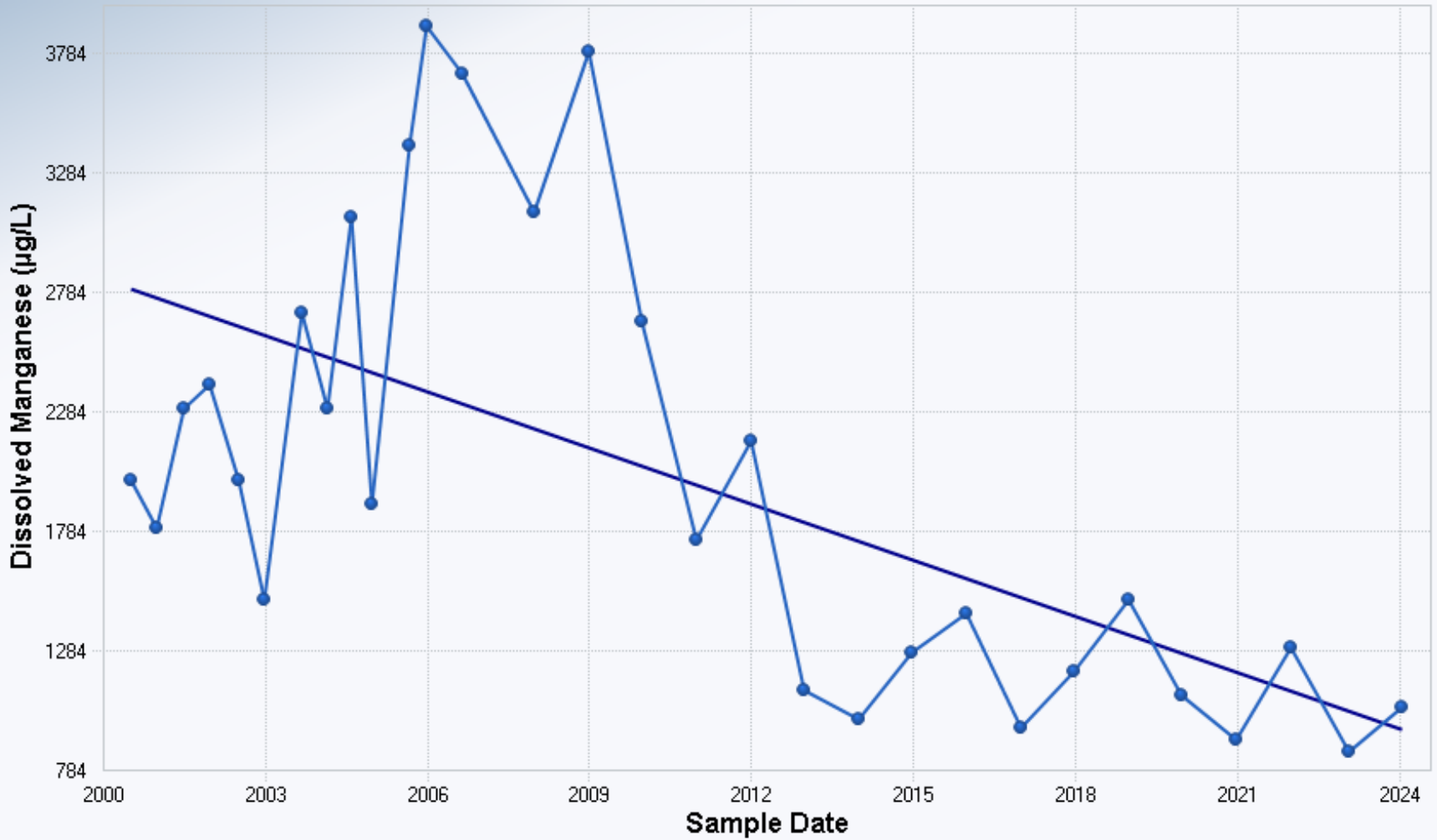
n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0506
Standardized Value of S	-0.8564
M-K Test Value (S)	-49
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1959

OLS Regression Line (Blue)

OLS Regression Slope	-21.0734
OLS Regression Intercept	43,331.0796

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-22X - Dissolved Manganese



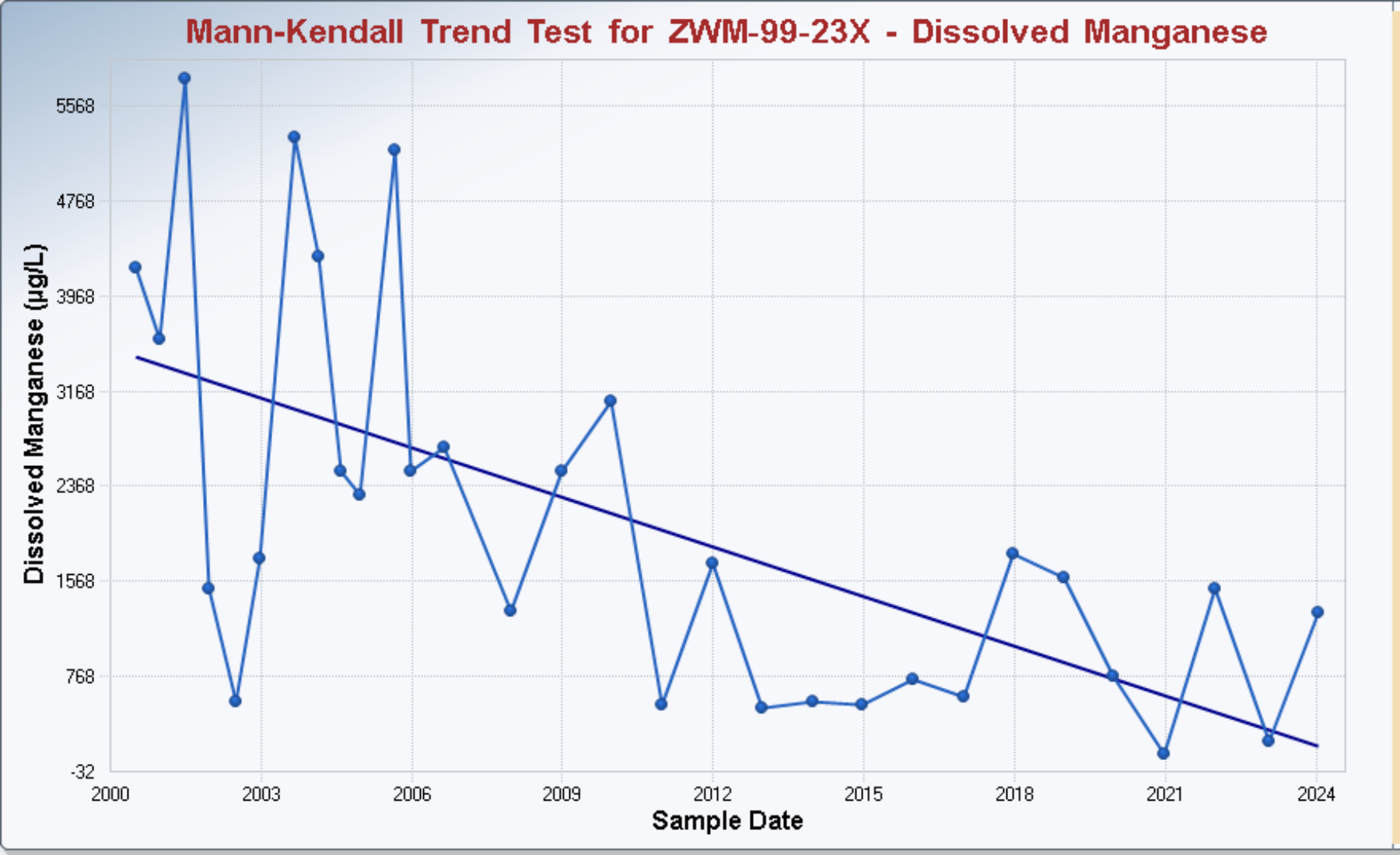
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0238
Standardized Value of S	-3.3022
M-K Test Value (S)	-186
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-78.1342
OLS Regression Intercept	159,089.0189

Statistically significant evidence of a decreasing trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0089
Standardized Value of S	-3.3923
M-K Test Value (S)	-191
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

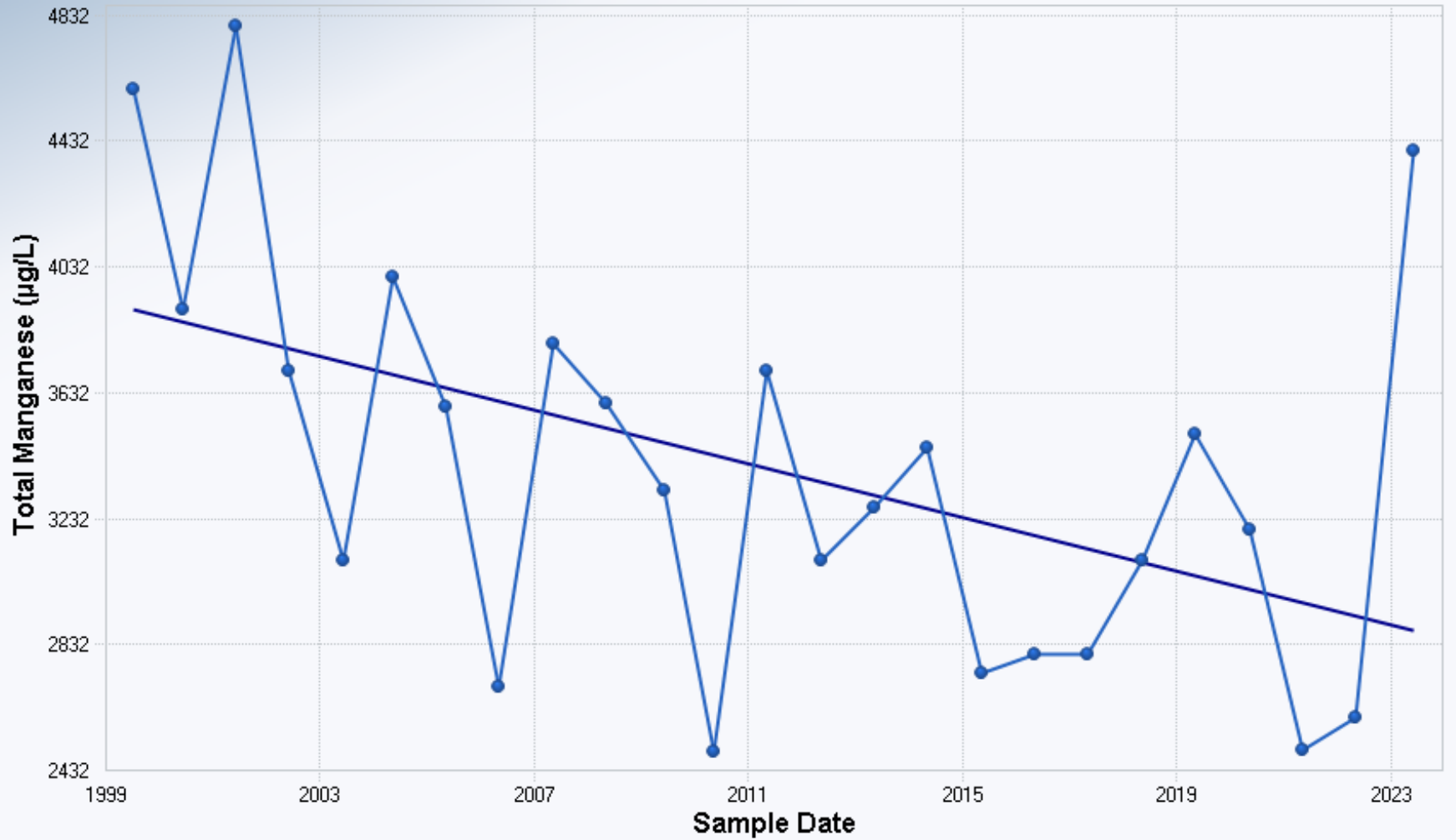
OLS Regression Slope	-138.9772
OLS Regression Intercept	281,454.9272

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G

AOC 43G
Total Manganese

Mann-Kendall Trend Test for AAFES-2 - Total Manganese



Mann-Kendall Trend Analysis

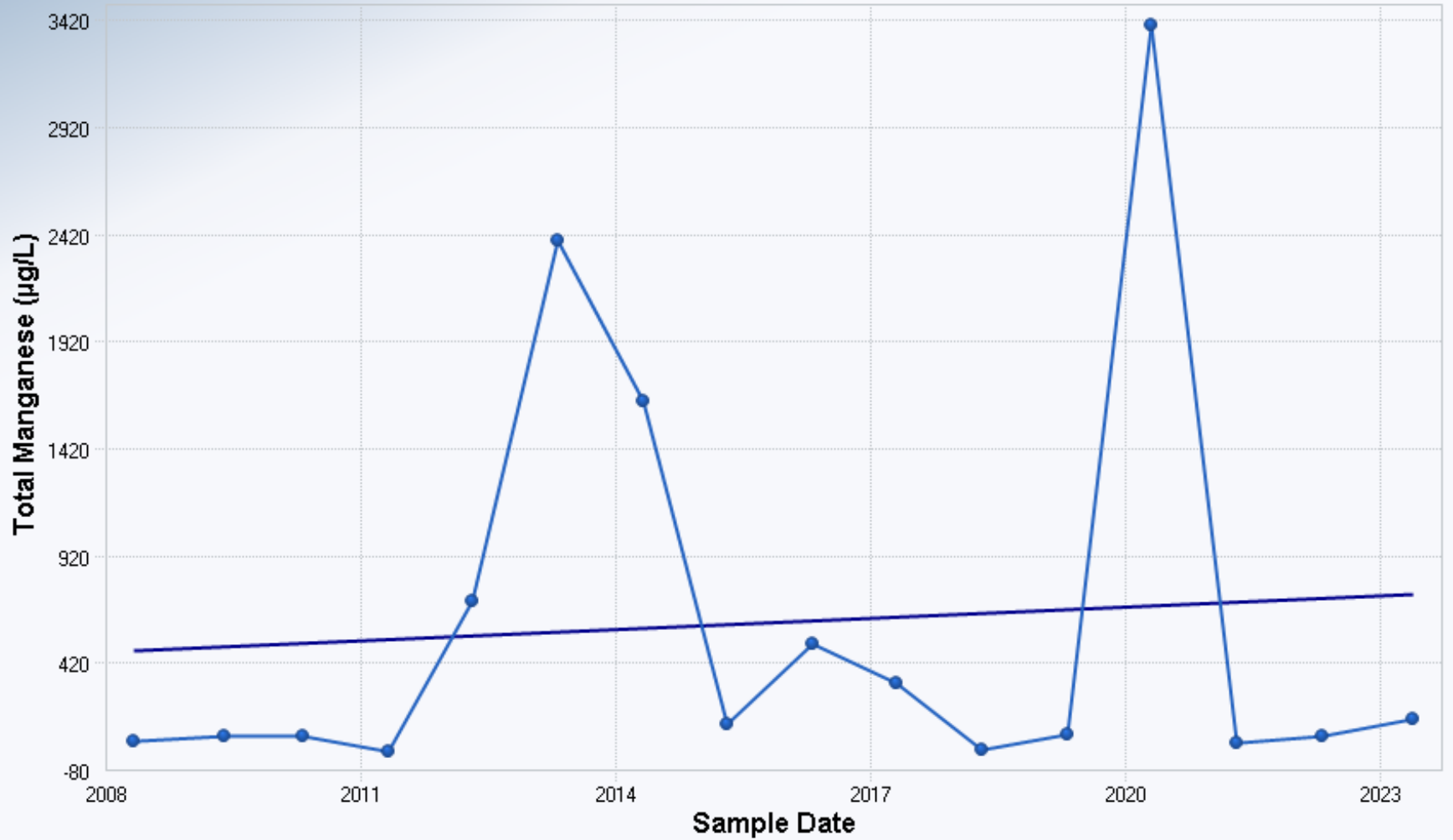
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7512
Standardized Value of S	-2.6666
M-K Test Value (S)	-115
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0038

OLS Regression Line (Blue)

OLS Regression Slope	-42.7538
OLS Regression Intercept	89,403.5767

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for AAFES-7 - Total Manganese



Mann-Kendall Trend Analysis

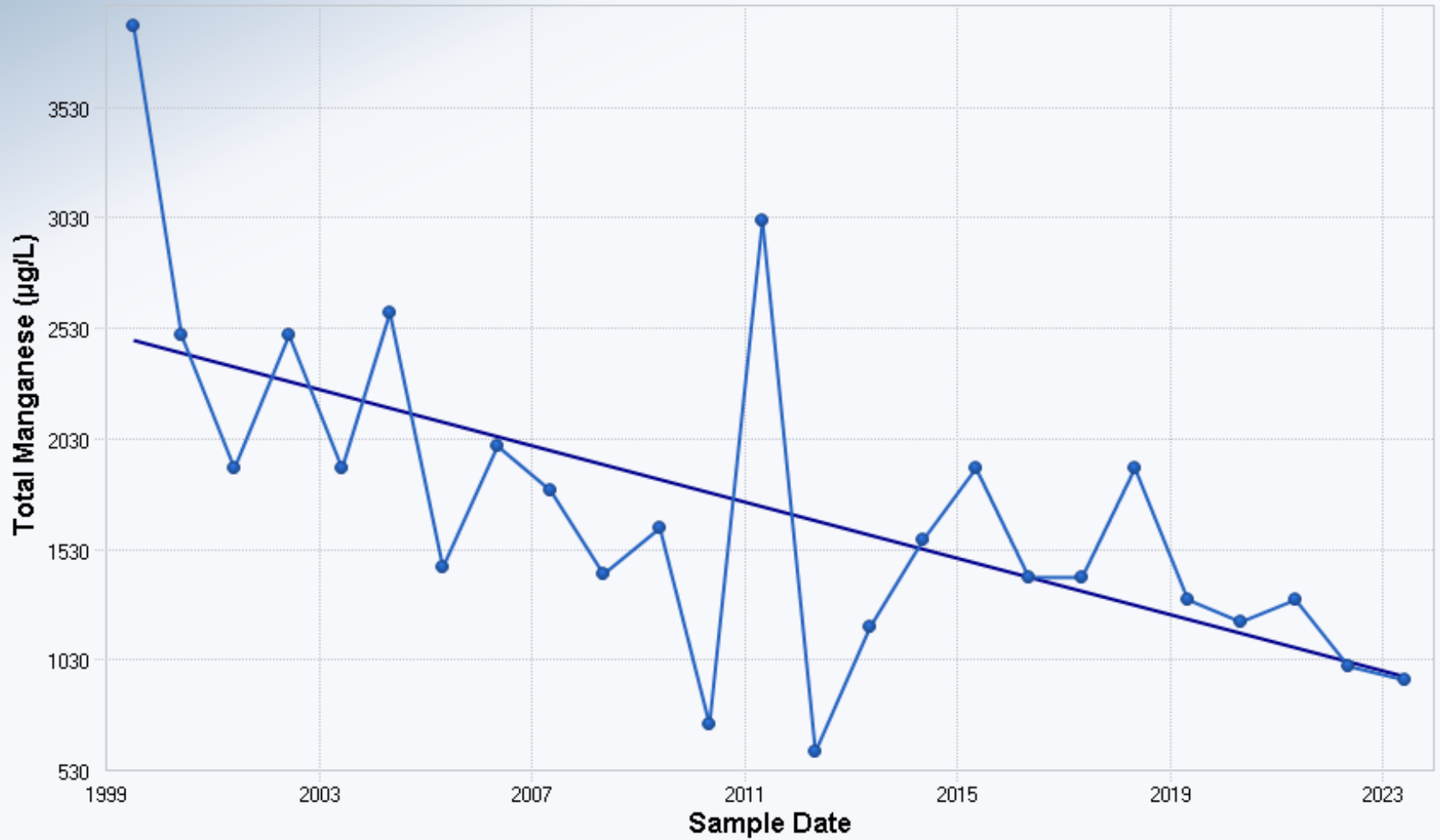
n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.2111
Standardized Value of S	0.2251
M-K Test Value (S)	6
Tabulated p-value	0.4120
Approximate p-value	0.4109

OLS Regression Line (Blue)

OLS Regression Slope	17.3900
OLS Regression Intercept	-34,456.2695

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-93-02X - Total Manganese



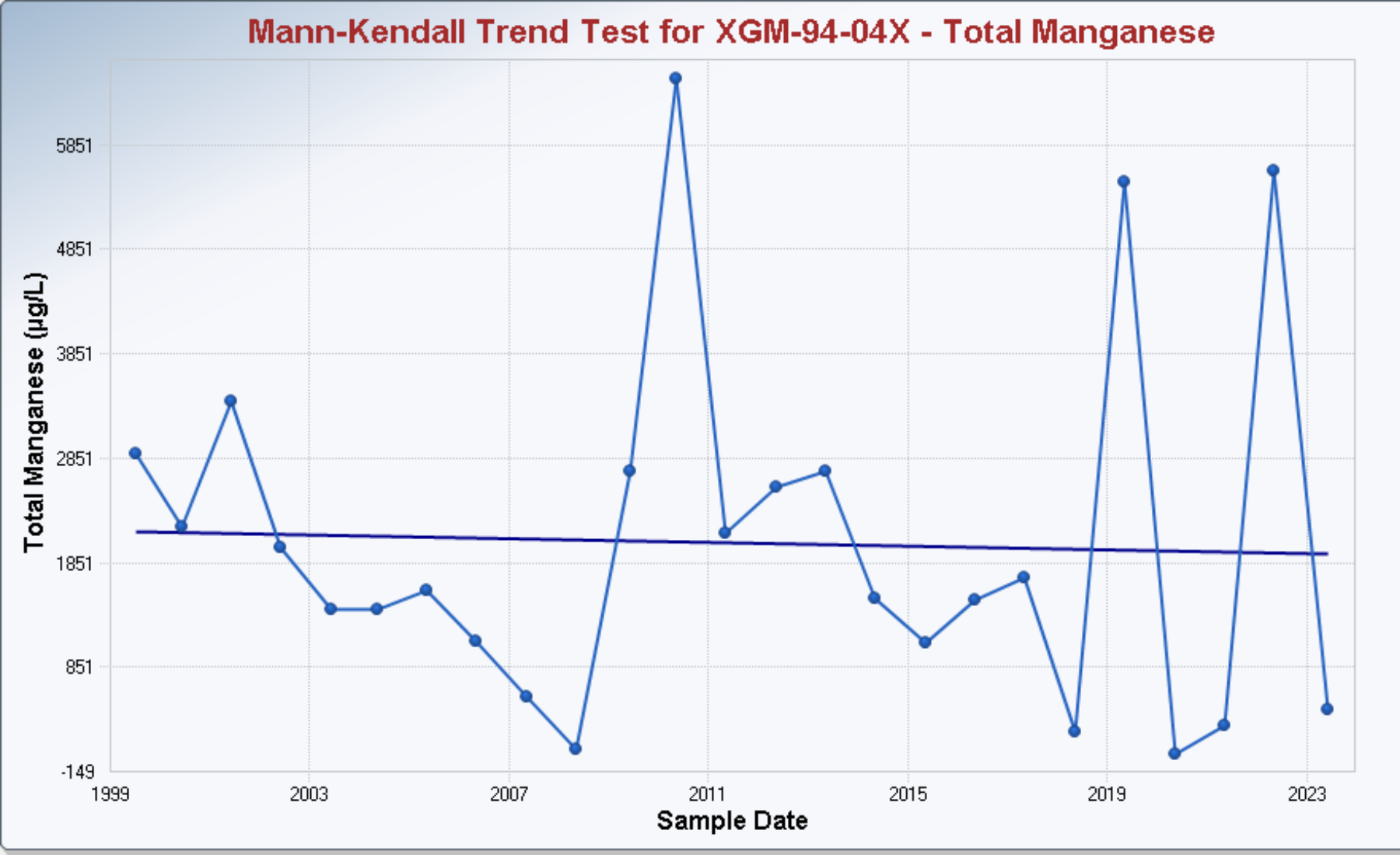
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.6810
Standardized Value of S	-3.6550
M-K Test Value (S)	-157
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-63.8399
OLS Regression Intercept	130,157.0250

Statistically significant evidence of a decreasing trend at the specified level of significance.



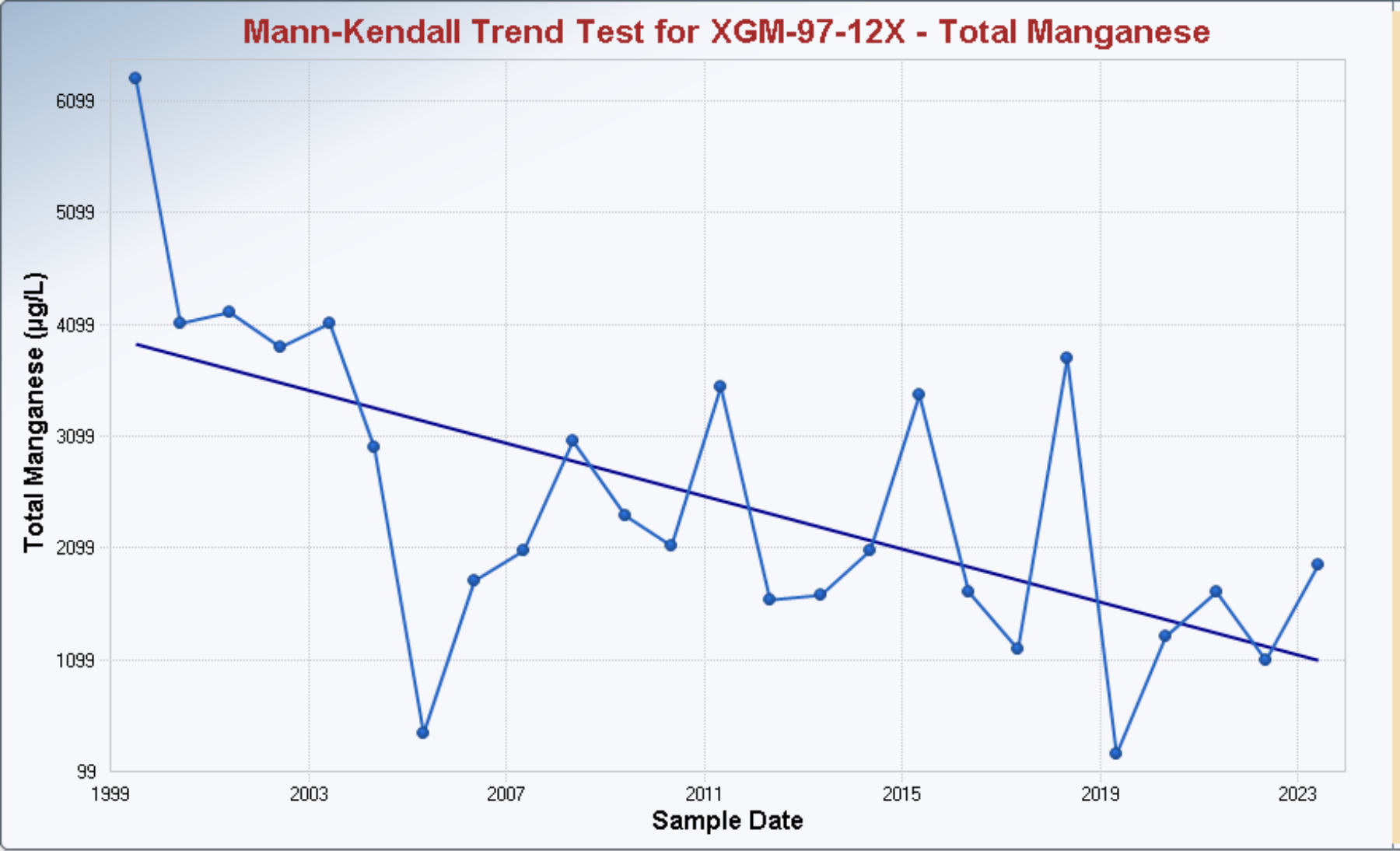
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7941
Standardized Value of S	-1.3320
M-K Test Value (S)	-58
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0914

OLS Regression Line (Blue)

OLS Regression Slope	-8.5969
OLS Regression Intercept	19,341.4430

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7941
Standardized Value of S	-3.2481
M-K Test Value (S)	-140
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0006

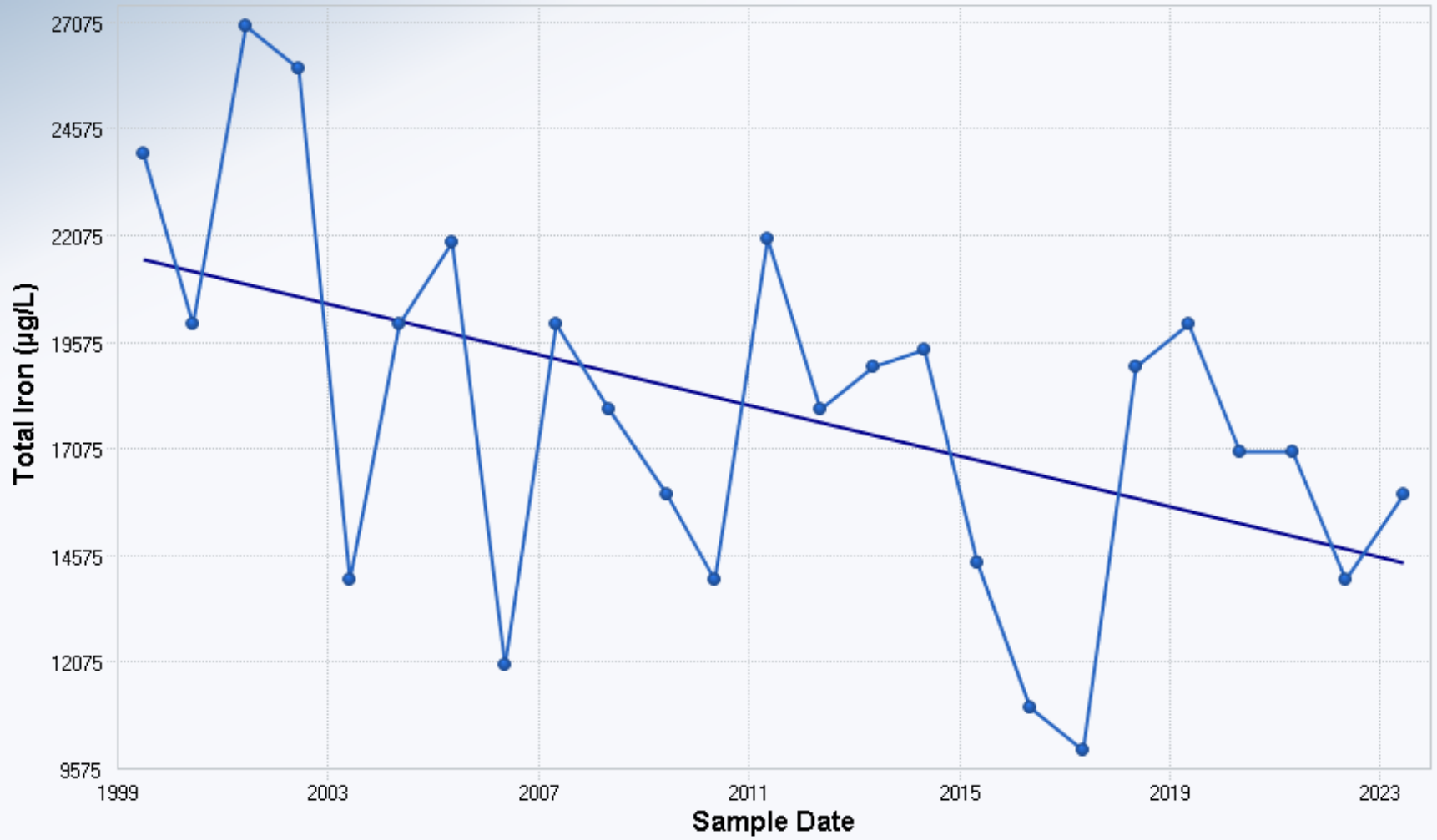
OLS Regression Line (Blue)

OLS Regression Slope	-118.4013
OLS Regression Intercept	240,717.3938

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
Total Iron

Mann-Kendall Trend Test for AAFES-2 - Total Iron



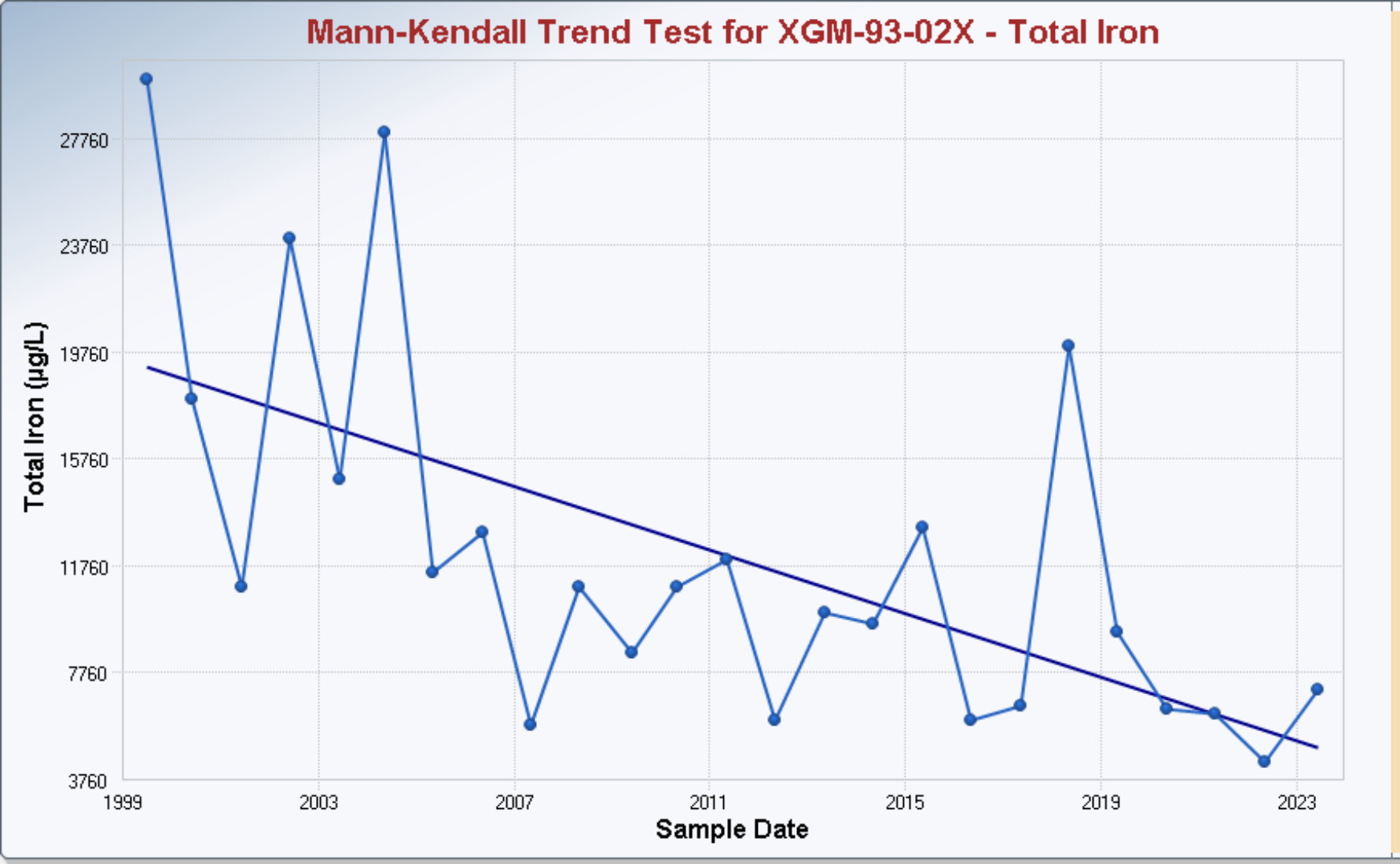
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.6263
Standardized Value of S	-2.5336
M-K Test Value (S)	-109
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0056

OLS Regression Line (Blue)

OLS Regression Slope	-297.8587
OLS Regression Intercept	617,227.7759

Statistically significant evidence of a decreasing trend at the specified level of significance.



Mann-Kendall Trend Analysis

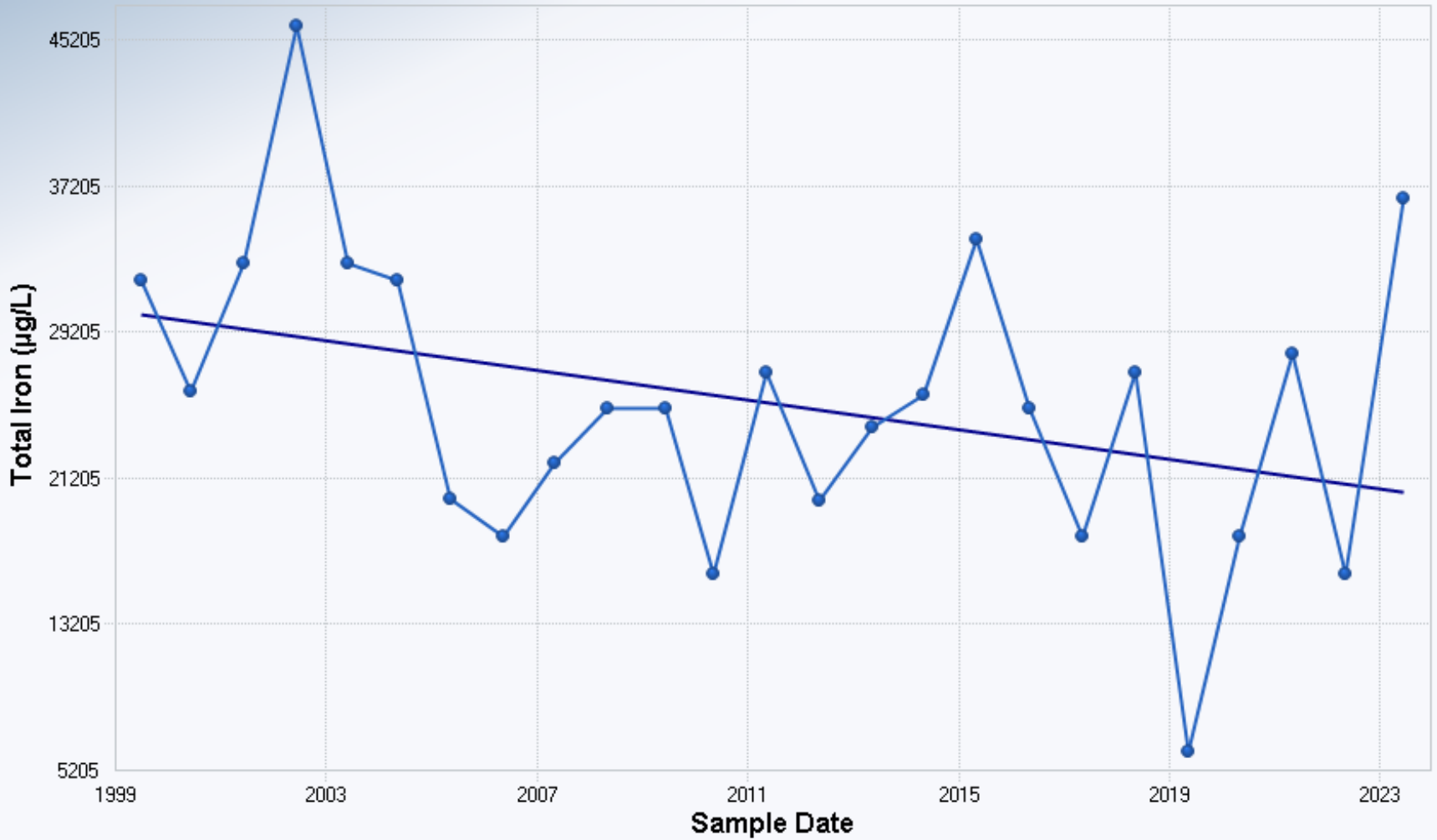
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7629
Standardized Value of S	-3.3440
M-K Test Value (S)	-144
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-596.3650
OLS Regression Intercept	1,211,921.4935

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - Total Iron



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.6849
Standardized Value of S	-1.4291
M-K Test Value (S)	-62
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0765

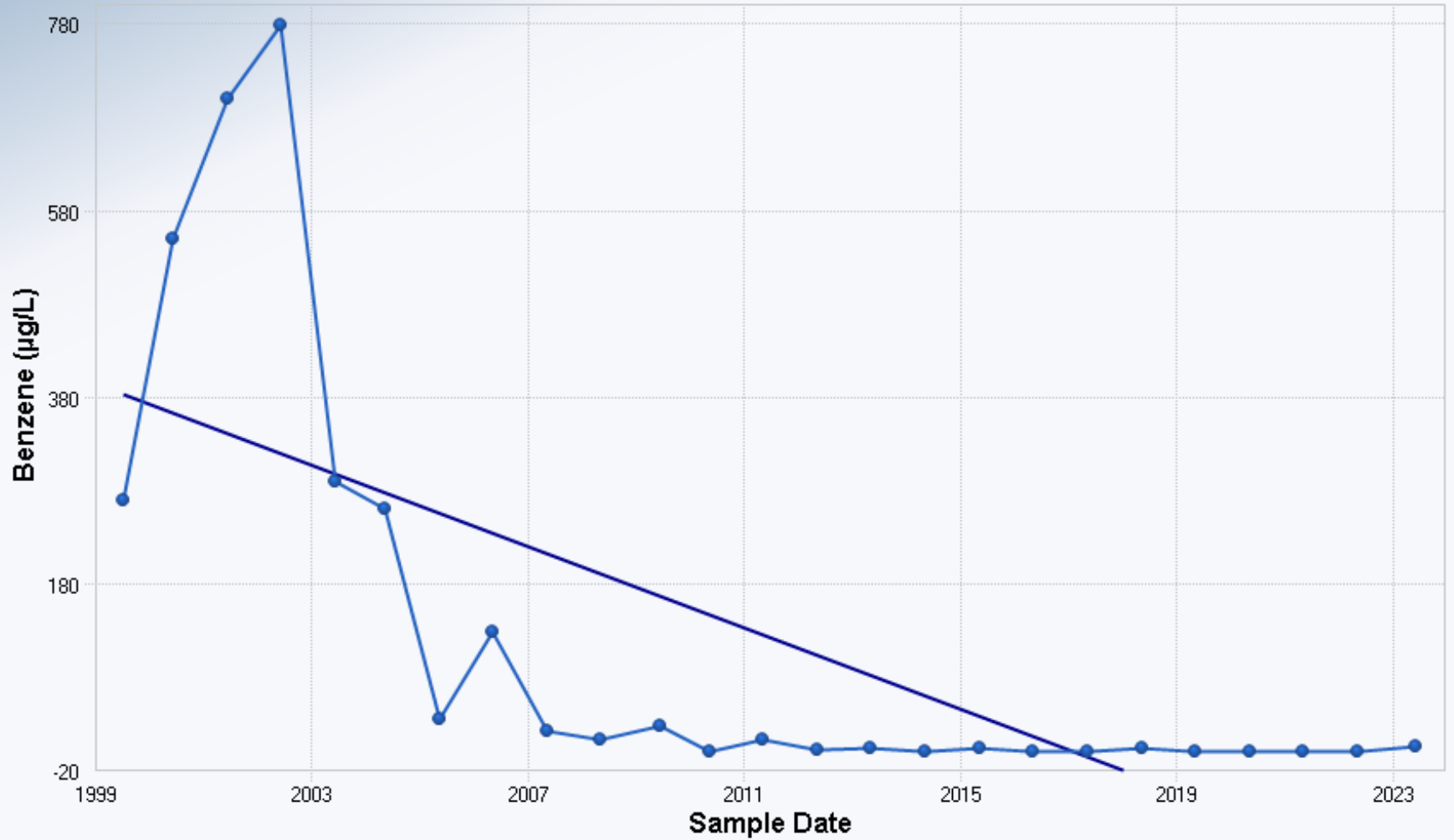
OLS Regression Line (Blue)

OLS Regression Slope	-407.6307
OLS Regression Intercept	845,437.8896

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOC 43G
Benzene

Mann-Kendall Trend Test for XGM-97-12X - Benzene



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.2966
Standardized Value of S	-4.7758
M-K Test Value (S)	-203
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-21.8389
OLS Regression Intercept	44,060.5919

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C_5-C_8

Mann-Kendall Trend Test for AAFES-2 - VPH C5-C8 Aliphatics

Mann-Kendall Trend Analysis

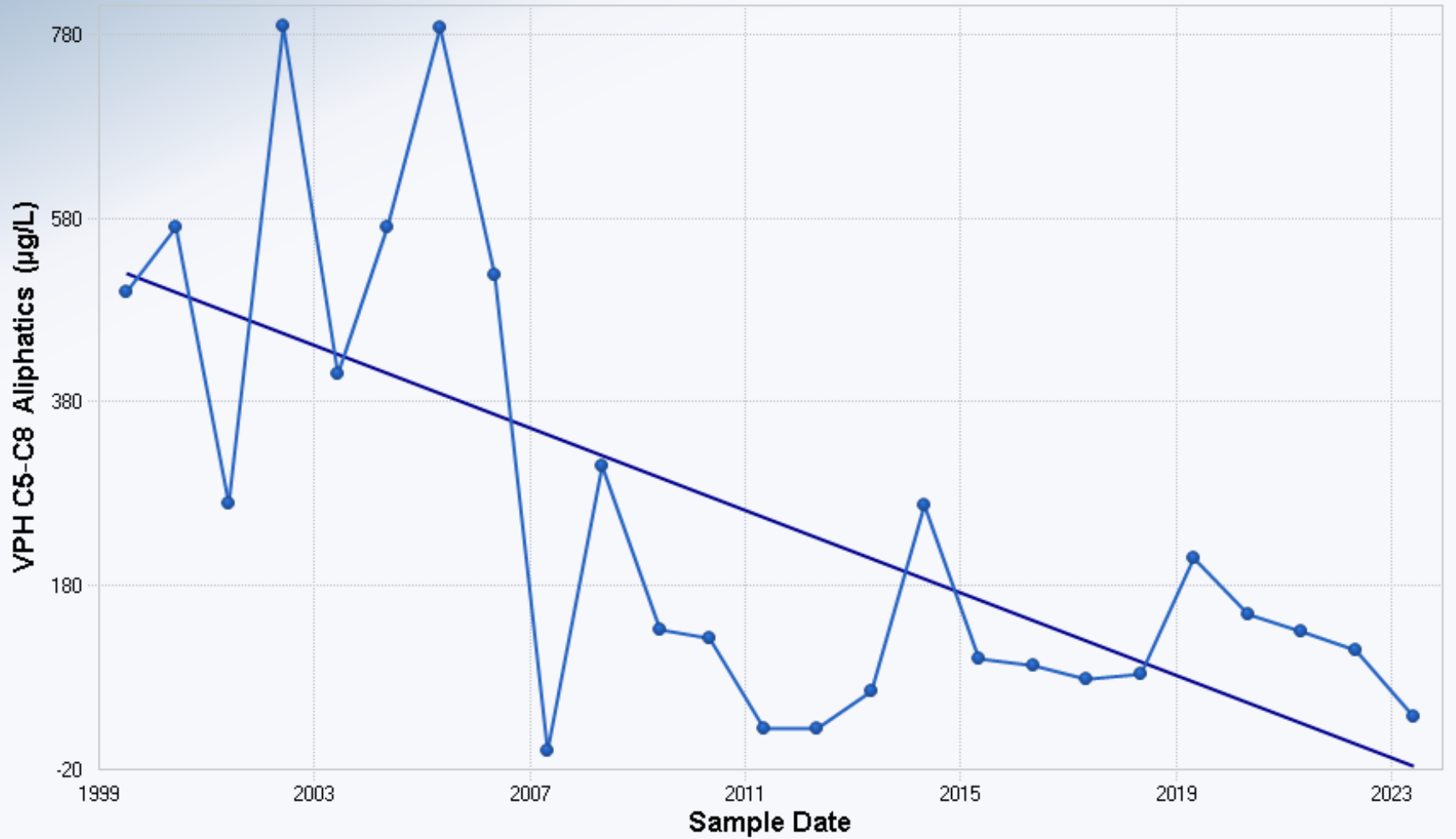
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7512
Standardized Value of S	-2.0584
M-K Test Value (S)	-89
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0198

OLS Regression Line (Blue)

OLS Regression Slope	-20.6151
OLS Regression Intercept	42,466.6990

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-93-02X - VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

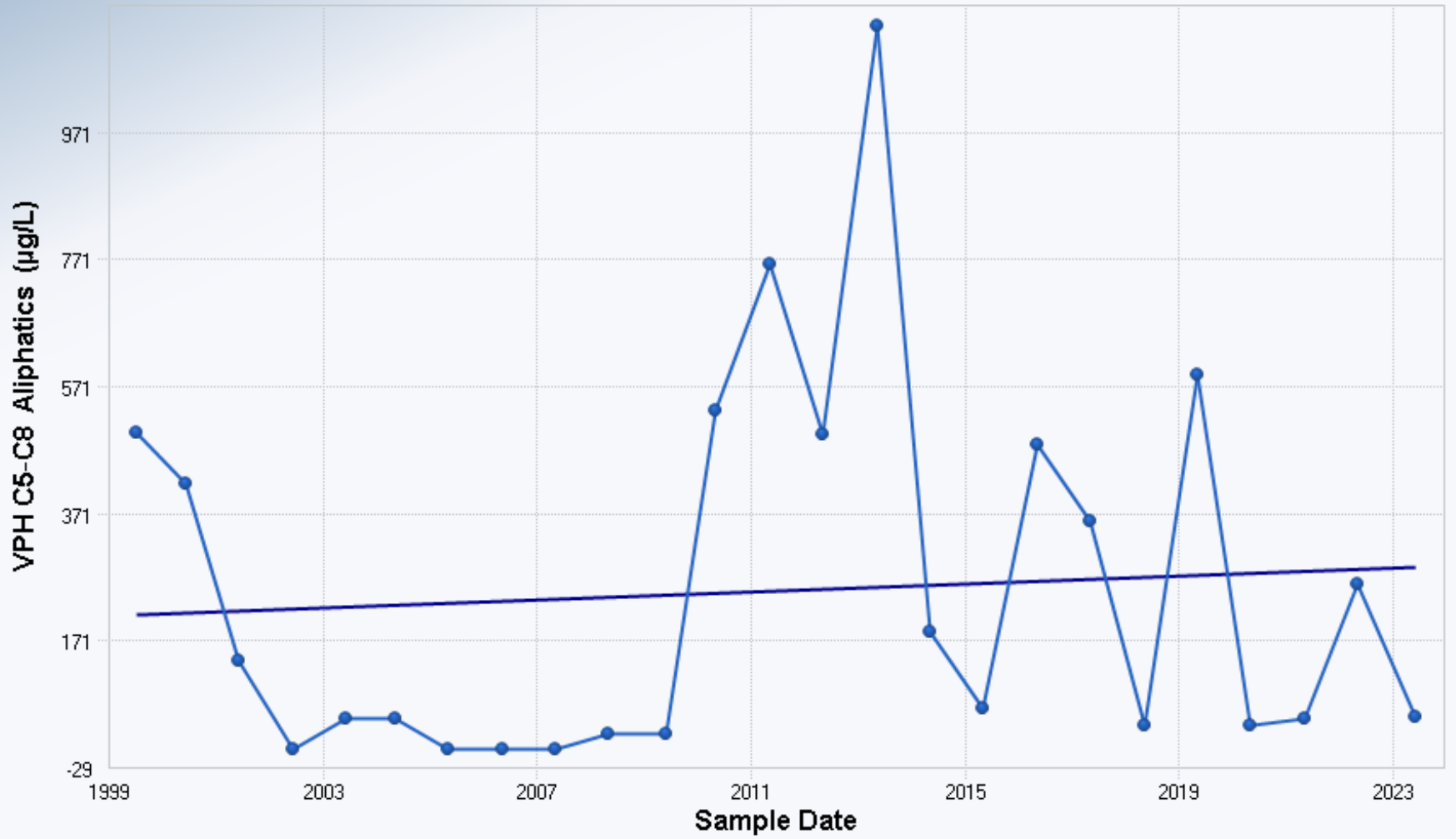
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7941
Standardized Value of S	-2.8275
M-K Test Value (S)	-122
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0023

OLS Regression Line (Blue)

OLS Regression Slope	-22.4623
OLS Regression Intercept	45,444.6473

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-94-04X - VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

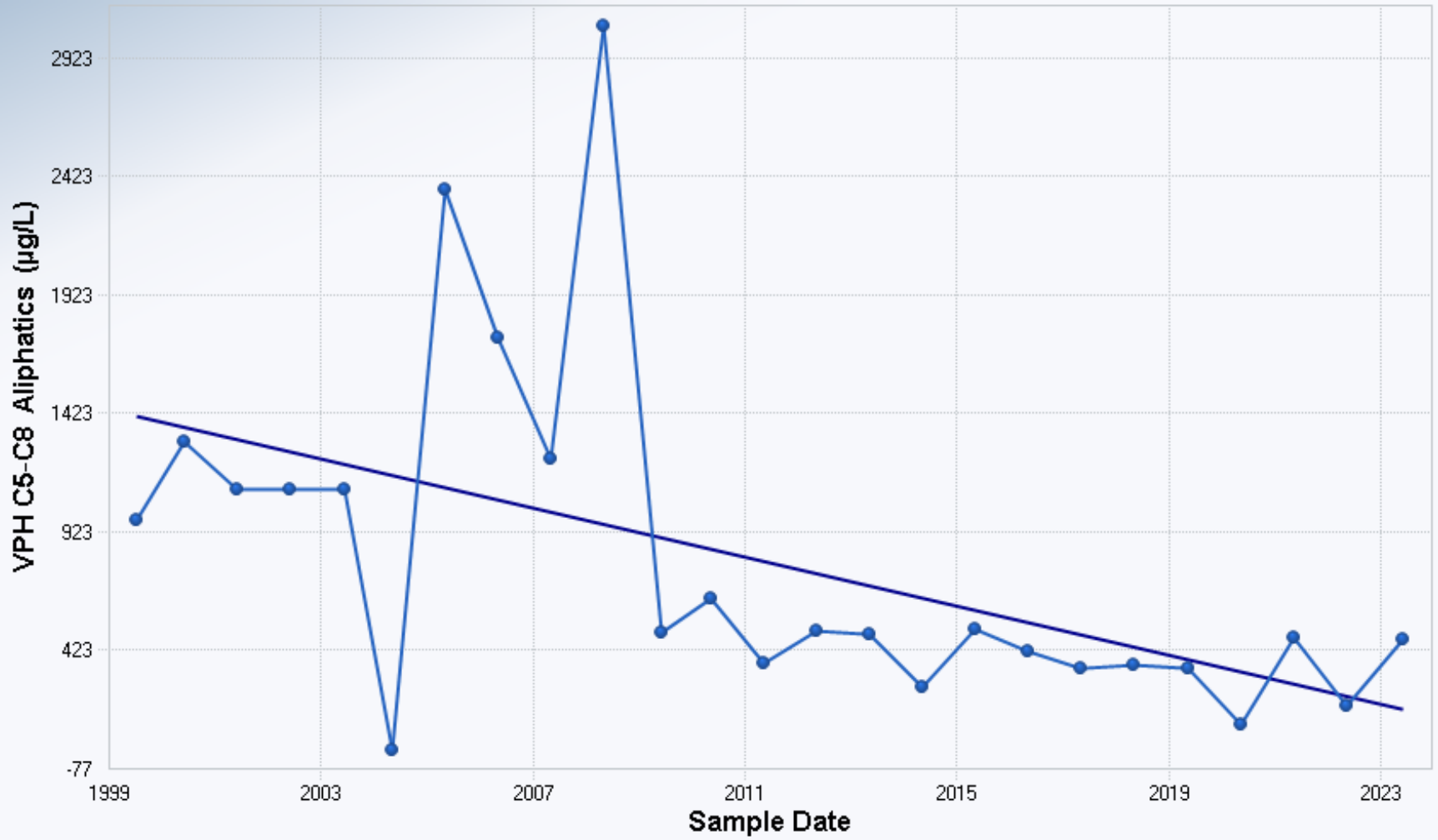
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.6497
Standardized Value of S	0.7034
M-K Test Value (S)	31
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2409

OLS Regression Line (Blue)

OLS Regression Slope	3.1010
OLS Regression Intercept	-5,988.1198

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7629
Standardized Value of S	-3.3440
M-K Test Value (S)	-144
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

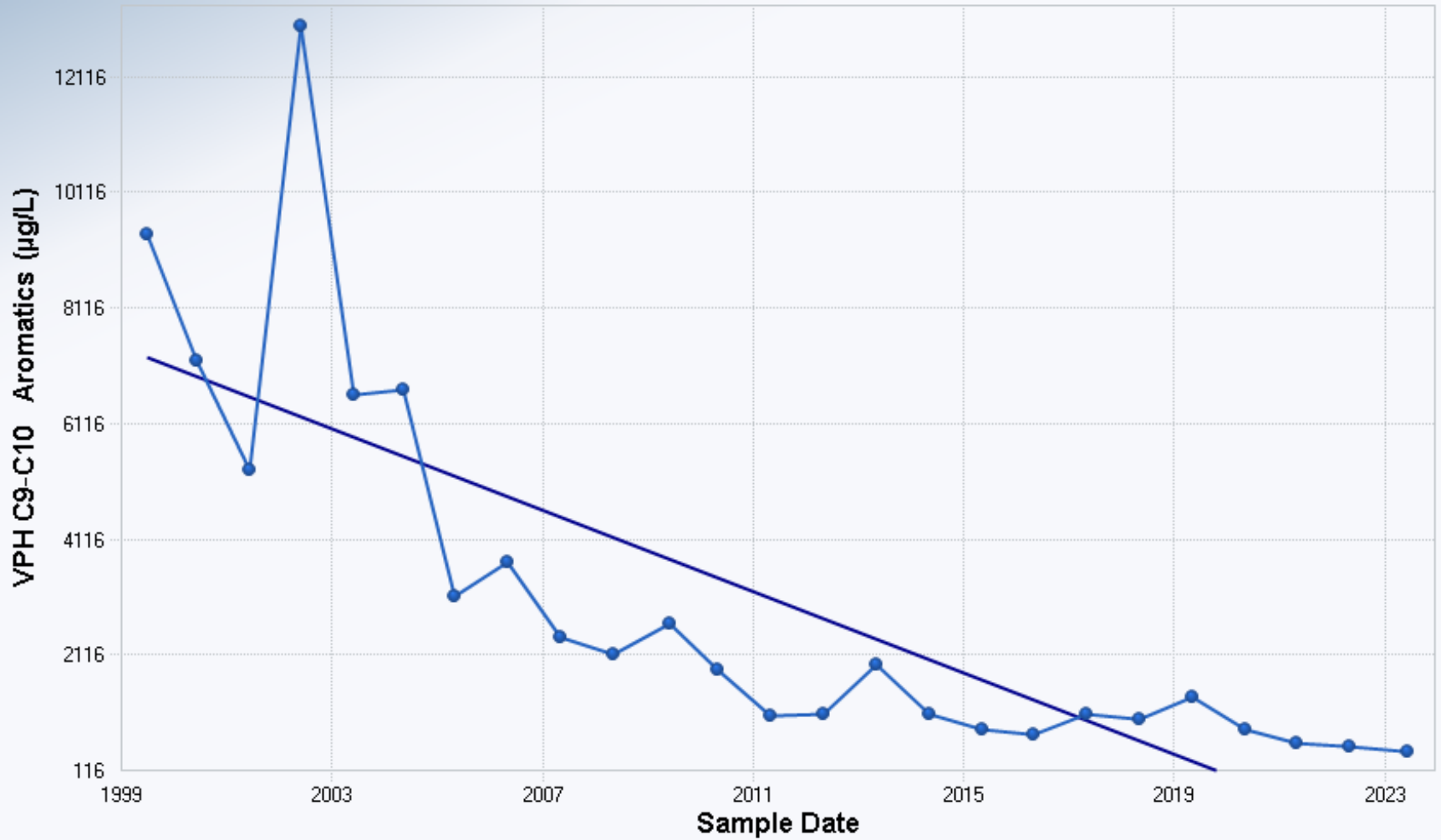
OLS Regression Line (Blue)

OLS Regression Slope	-51.7169
OLS Regression Intercept	104,845.3846

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C_9-C_{10}

Mann-Kendall Trend Test for AAFES-2 - VPH C9-C10 Aromatics



Mann-Kendall Trend Analysis

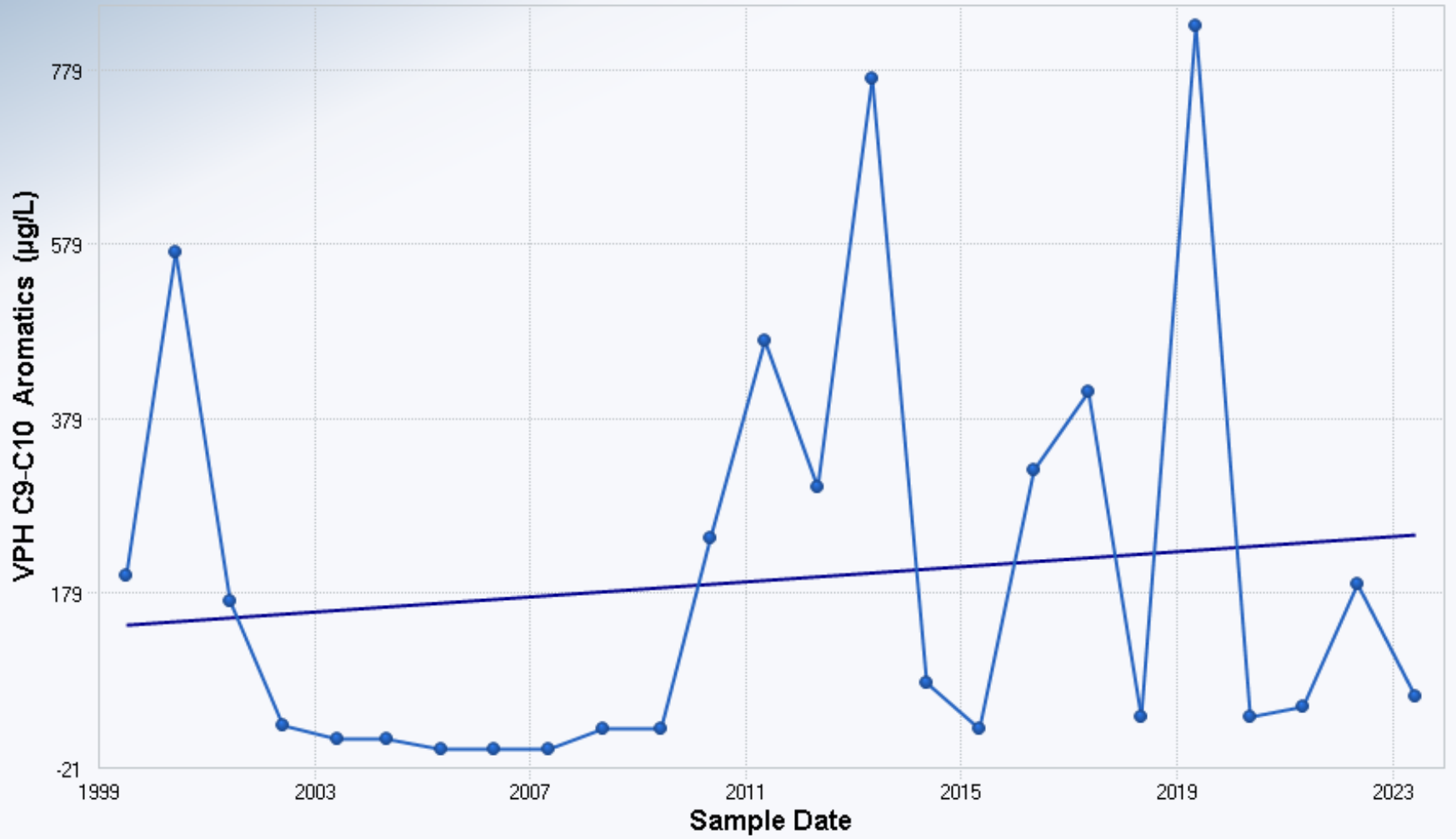
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8058
Standardized Value of S	-5.6067
M-K Test Value (S)	-241
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-352.8654
OLS Regression Intercept	712,971.1334

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for for XGM-94-04X - VPH C9-C10 Aromatics



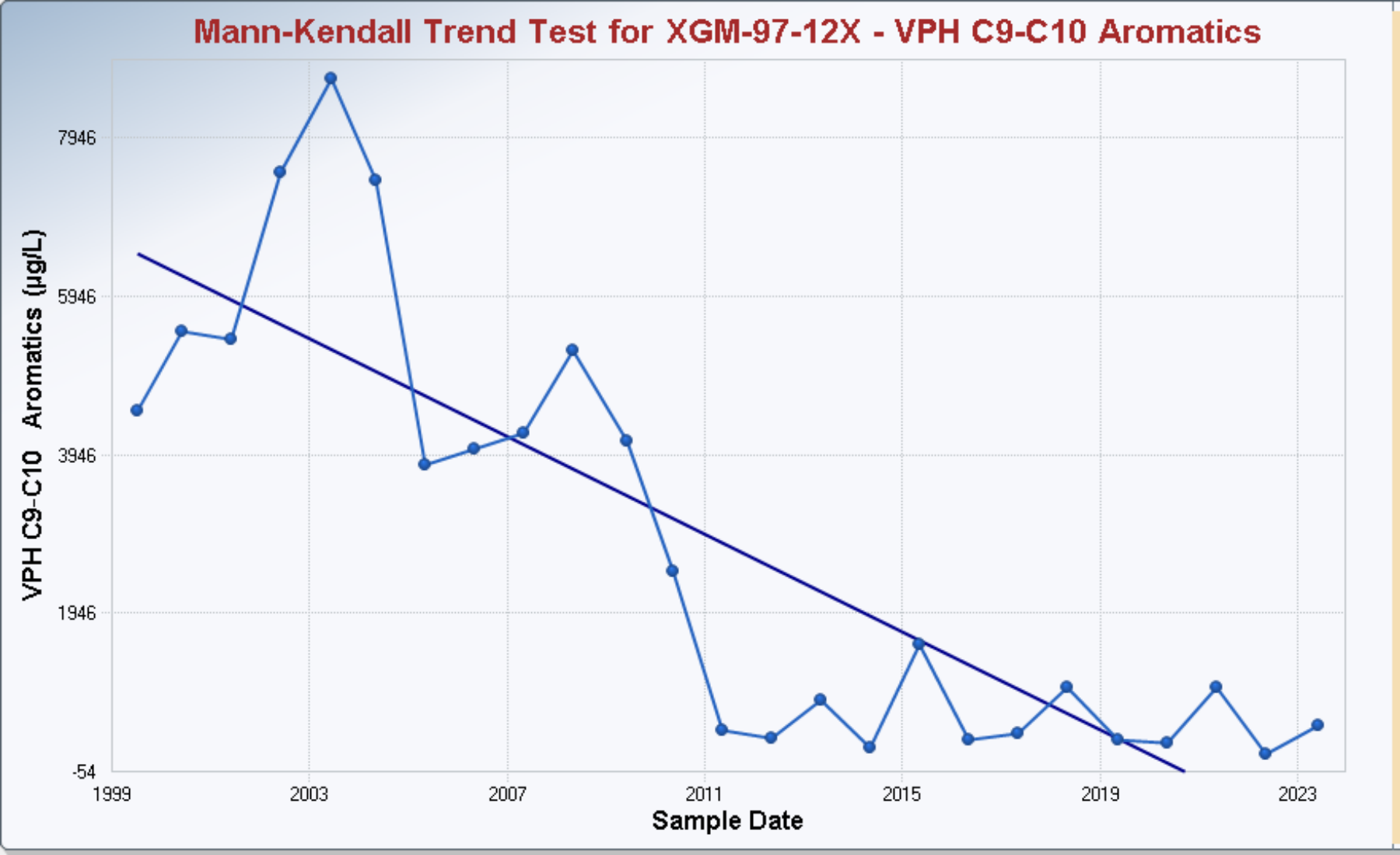
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7083
Standardized Value of S	1.2878
M-K Test Value (S)	56
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0989

OLS Regression Line (Blue)

OLS Regression Slope	4.3367
OLS Regression Intercept	-8,530.1365

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7941
Standardized Value of S	-4.3698
M-K Test Value (S)	-188
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

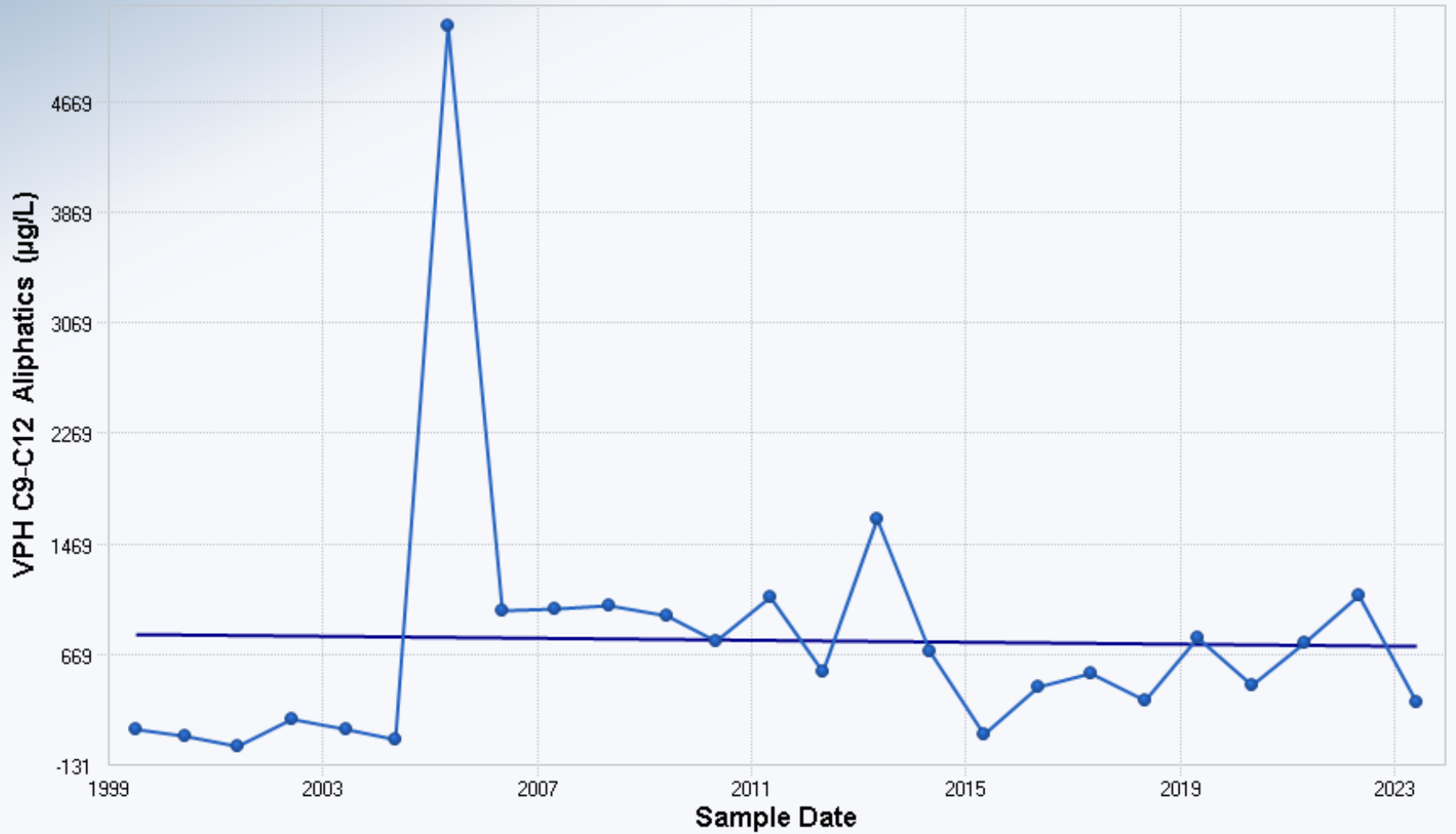
OLS Regression Line (Blue)

OLS Regression Slope	-308.4700
OLS Regression Intercept	623,405.9303

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C_9-C_{12}

Mann-Kendall Trend Test for AAFES-2 - VPH C9-C12 Aliphatics



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8058
Standardized Value of S	0.9345
M-K Test Value (S)	41
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1750

OLS Regression Line (Blue)

OLS Regression Slope	-3.2620
OLS Regression Intercept	7,333.7842

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - VPH C9-C12 Aliphatics

Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8058
Standardized Value of S	0.7008
M-K Test Value (S)	31
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2417

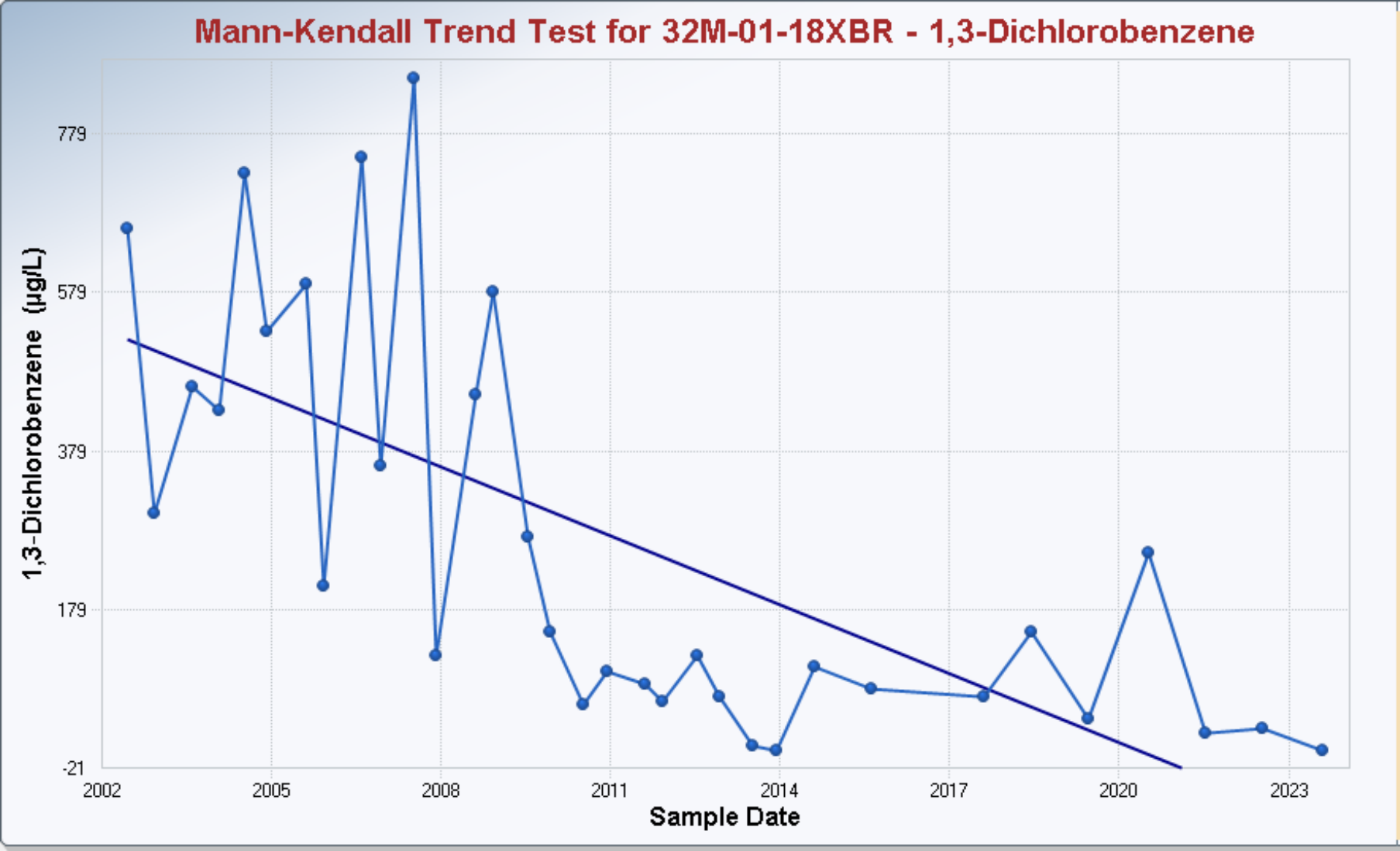
OLS Regression Line (Blue)

OLS Regression Slope	-27.2922
OLS Regression Intercept	55,721.0808

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOCs 32 & 43A

AOC 32 & 43A
1,3-Dichlorobenzene



Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5161
Standardized Value of S	-4.7430
M-K Test Value (S)	-307
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

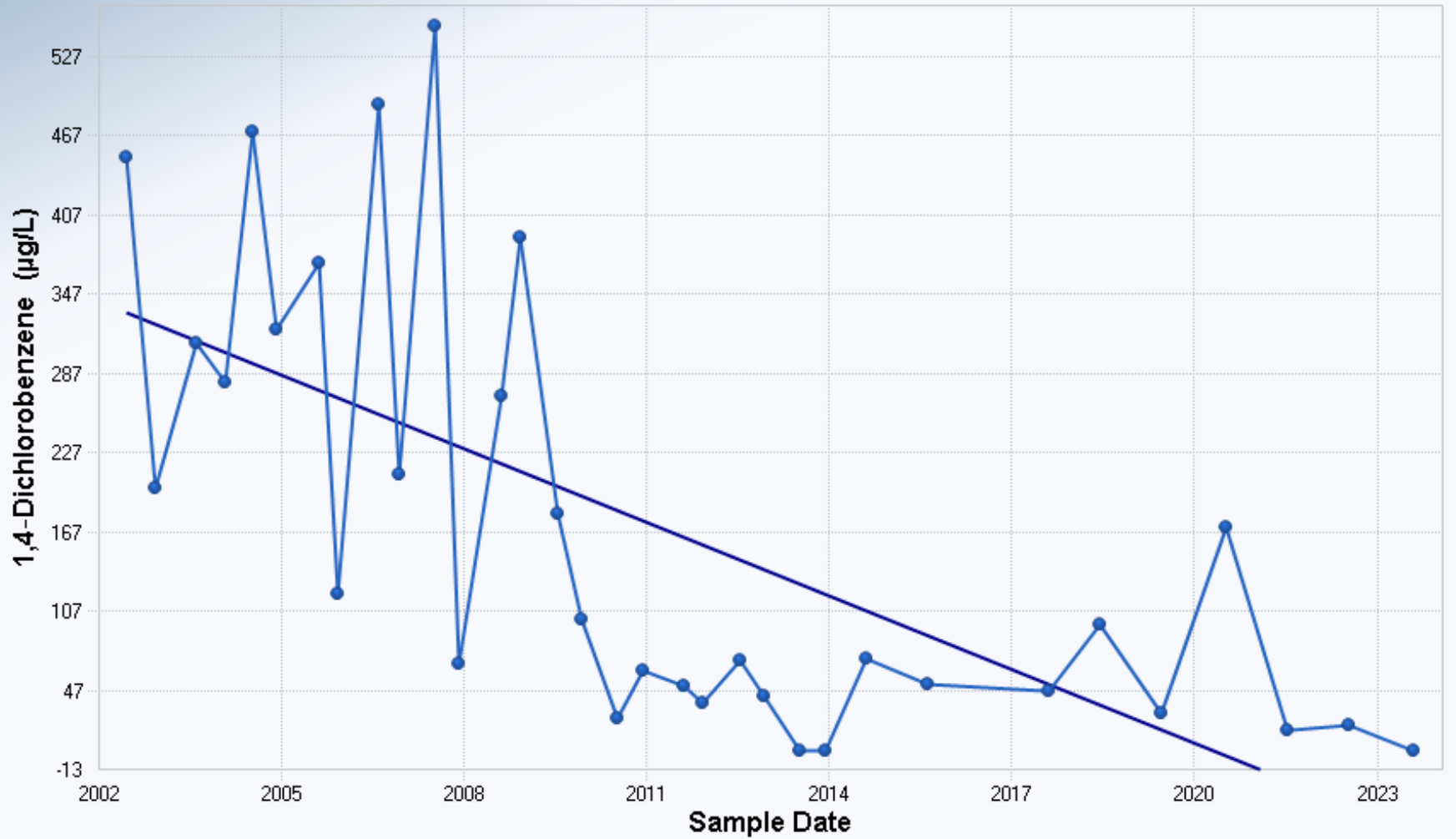
OLS Regression Line (Blue)

OLS Regression Slope	-29.0671
OLS Regression Intercept	58,721.6470

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
1,4-Dichlorobenzene

Mann-Kendall Trend Test for 32M-01-18XBR - 1,4-Dichlorobenzene



Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5394
Standardized Value of S	-4.6018
M-K Test Value (S)	-298
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

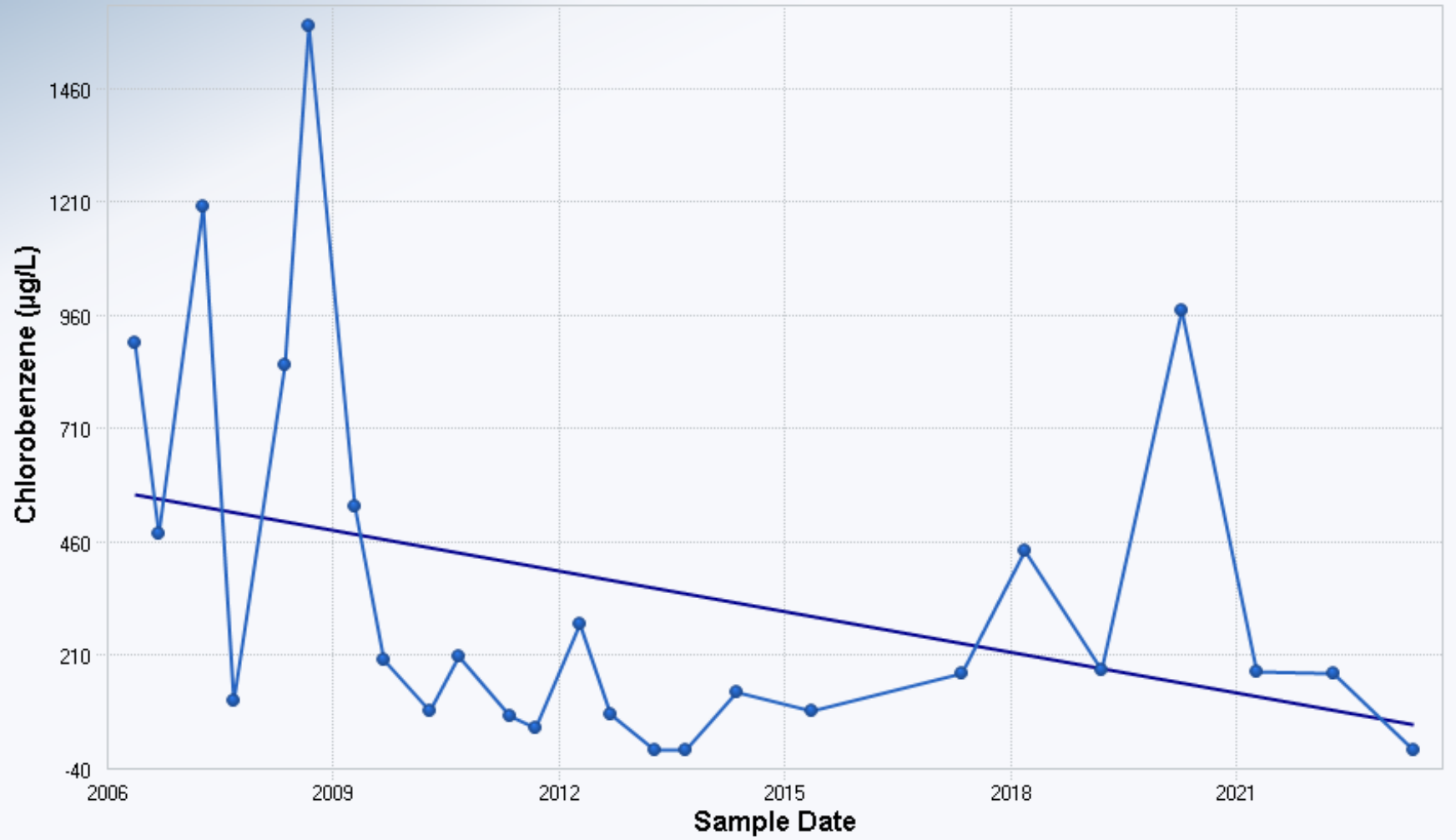
OLS Regression Line (Blue)

OLS Regression Slope	-18.6396
OLS Regression Intercept	37,655.5863

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Chlorobenzene

Mann-Kendall Trend Test for 32M-01-18XBR - Chlorobenzene



Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8058
Standardized Value of S	-2.0091
M-K Test Value (S)	-87
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0223

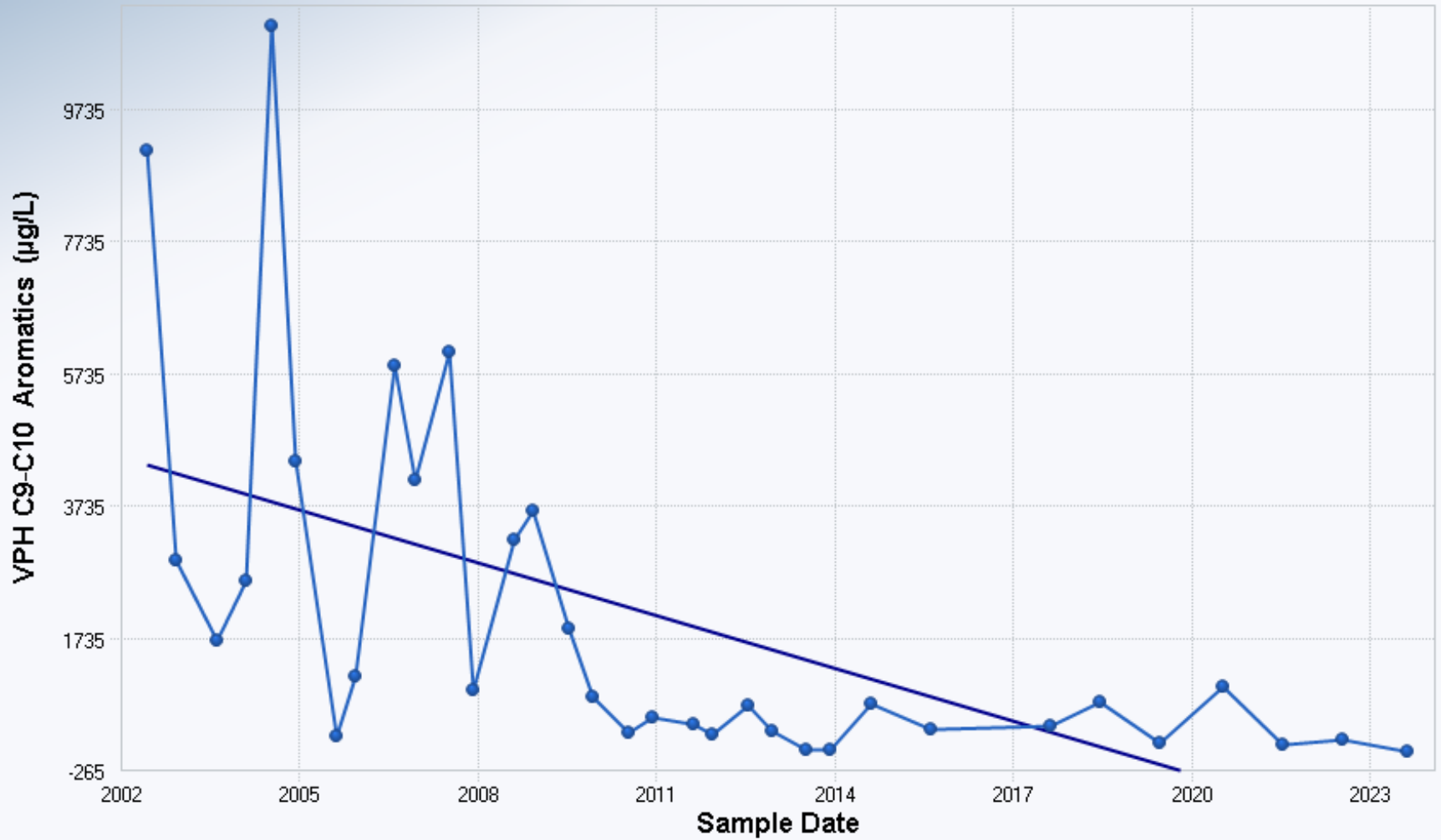
OLS Regression Line (Blue)

OLS Regression Slope	-29.8064
OLS Regression Intercept	60,371.4994

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
VPH C_9-C_{10}

Mann-Kendall Trend Test for 32M-01-18XBR - VPH C9-C10 Aromatics



Mann-Kendall Trend Analysis

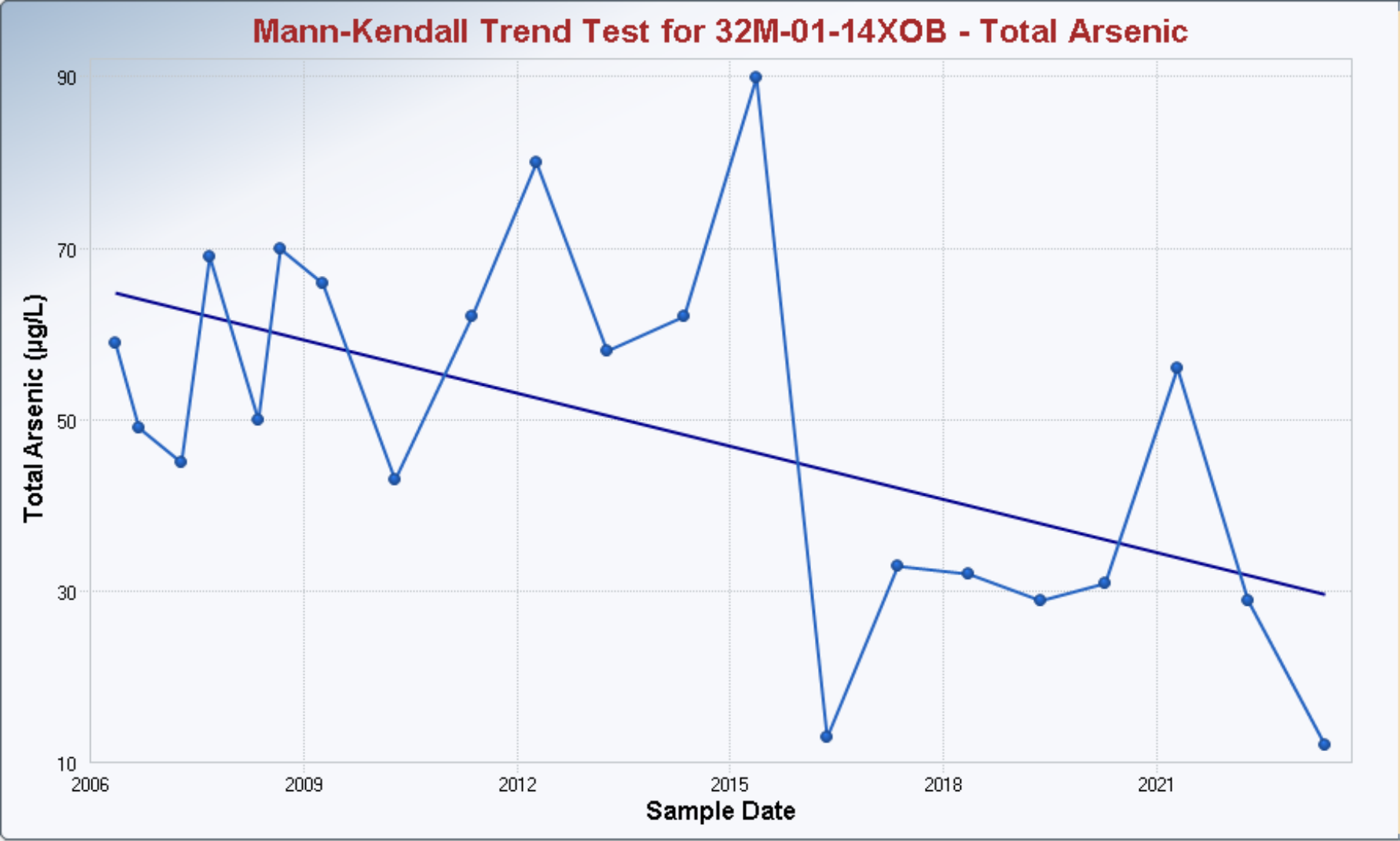
n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	-4.4629
M-K Test Value (S)	-289
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-266.9087
OLS Regression Intercept	538,795.0183

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Total Arsenic



Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0857
Standardized Value of S	-2.3273
M-K Test Value (S)	-78
Tabulated p-value	0.0090
Approximate p-value	0.0100

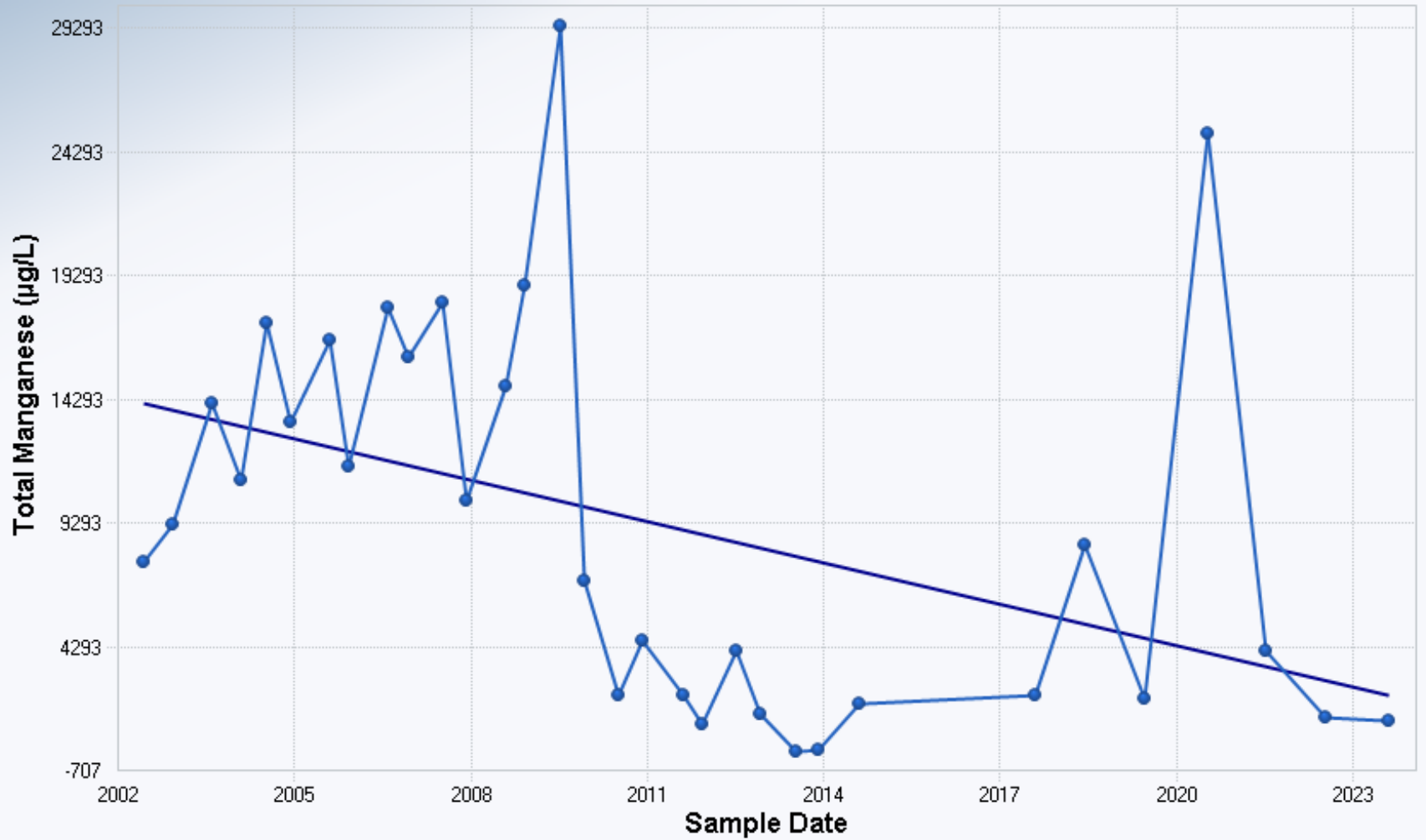
OLS Regression Line (Blue)

OLS Regression Slope	-2.0663
OLS Regression Intercept	4,210.7014

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Total Manganese

Mann-Kendall Trend Test for 32M-01-18XBR - Total Manganese



Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	-3.0008
M-K Test Value (S)	-186
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0013

OLS Regression Line (Blue)

OLS Regression Slope	-558.3893
OLS Regression Intercept	1,132,190.0166

Statistically significant evidence of a decreasing trend at the specified level of significance.

Appendix F

Annual Land Use Control Documentation

Inspection Checklist for Housing Areas

I. Grant/Oak/Maple HA and Impact Area Annual Review Checklist		
Site Name/Location: Grant HA and Impact Area	Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls		
Inspection Date: November 27, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE), Hugh Sease (SRS)		
II. Physical On-Site Inspection (Impact Area)		
Item	**Yes/No**	**Comments**
Any UXO discovered? If yes, any surface or near surface UXO?	No	The physical inspection was conducted with a Schonstedt HeliFlux Magnetic Locator, Model GA-52Cx which has the capability to detect a 37mm round down to a depth of approximately 12-14 inches below ground surface. No surficial UXOs were detected. Some metallic objects encountered (pin flags, metal stakes, etc.). There were two areas where metal detector hits could not be confirmed; objects were greater than 12-14 inches below ground surface.
Is there evidence of damage to the fencing and signage?	Yes	Fencing was observed to be in good condition, with the exception of a small area south of the upper gate area that was damaged by a fallen tree; the fence will be scheduled for repair by the JV. The access gates were observed to be in good condition. Locks on the gates and keys around the site are inconsistent and one lock could not be opened; locks will be standardized by the JV prior to the next inspection. Signage was clearly visible and present along the perimeter of the fence line.
Any evidence of unauthorized access?	No	
III. Interview		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment), Rich Holcomb (Commonwealth Fusion Systems), Kathleen Brill (Foley Hoag LLP)		
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929; rholcomb@cfs.energy, 508-667-4582; kbrill@foleyhoag.com, 617-832-1229		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.		
Site Updates: LUCs for Grant Housing Area and 37-mm Impact Area are defined in the 2011 LUCIP. The Grant HA is currently zoned for residential reuse and the Impact Area is restricted for future use. The remedy for the Oak and Maple Housing Area was incorporated into the Grant HA and Impact Area site via a 2014 Explanation of Differences (ESD). The remedy included LUC interviews. A LUCIP addendum for the Oak and Maple HA (as well as a portion of the Grant HA) was completed in April 2021; this "Restricted Area" is currently zoned for commercial uses (innovation and technology business).		
Item	**Yes/No**	**Comments**
Impact Area		
Any UXO discovered?	No	

Inspection Checklist for Housing Areas

Was any work conducted or planned regarding utility repair or emergency work?	No	
Restricted Area (Former Oak and Maple HA, portion of Grant HA)		
Any UXO discovered?	No	
Is the Site-Specific Soil Management Plan (SSSMP) and UXO information pamphlet available on the Devens Enterprise Commission website?	Yes	
Was a current version of the SSSMP distributed to MassDevelopment (and other current/future owners of property within the Restricted Area), Devens Fire Department, and local/State Police?	Yes	
Did ground intrusive construction activities occur during the reporting period?	Yes	Construction work was completed on utility buildings in areas previously screened for UXOs (no soil management required)
Were construction contractors provided with a current version of the soils management policy?	N/A	No soils management work completed in 2023.
Were all contractors required to attend the UXO awareness training prior to commencing ground intrusive activities?	N/A	No intrusive activities completed in 2023.
Were any amendments to the Notice of Activity and Use Limitation (NAUL) recorded/executed?	No	
Was a physical inspection conducted in the Restricted Area?	N/A	No physical inspections of the restricted area were required in 2023.
Unrestricted/Residential Use Area (Grant HA)		
Any UXO discovered?	No	
Is the Soil Management Plan and UXO information pamphlet available on the Devens Enterprise Commission website?	Yes	
Has the required educational pamphlet/utility bill insert been included in utility bill mailings to owners, lessees, and/or tenants?	Yes	Mailings sent on an annual basis for existing customers and as-needed for any new customers.
Has the educational pamphlet/utility bill insert been posted in a conspicuous location?	Yes	A total of seven signs are posted throughout the Grant HA, and will be inspected in 2024. A semi-permanent kiosk was constructed in 2022 in Central Park along Grant Road.
Did ground intrusive construction activities occur during the reporting period?	No	
Were construction contractors provided with a current version of the soils management policy?	Yes	
Were all contractors required to attend the UXO awareness training prior to commencing ground intrusive activities?	Yes	
Was the Supplemental Deed Notice included in deeds conveying portions of the unrestricted/residential use area?	Yes	
Was a physical inspection conducted at the unrestricted/residential use area?	Yes	Yes, routine site walks and inspections completed by MassDevelopment and the Devens Enterprise Commission as a part of property redevelopment.

Inspection Checklist for Housing Areas

IV. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for AOC 57

I. Site Information		
Site Name/Location: AOC 57 - Area 2 and Area 3	Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls, Wetlands protection		
Inspection Date: November 29, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE)		
II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	Some brush cutting performed to maintain trail area (no intrusive activities)
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals or notices of intent found?	No	
III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Is there evidence of damage to the remedy?	No	
Any damage to on-site monitoring wells?	No	Wells observed to be in good condition.
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	Vegetation clearance needed around some monitoring wells.
Any signs of increased exposure potential?	No	
IV. Interview		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)		
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	
Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	

Is drinking water supplied from off-site?	Yes	
Are there any issues with site access for monitoring?	No	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUCs necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for AOC 69W

I. Site Information		
Site Name/Location: AOC 69W	Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls		
Inspection Date: November 28, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE)		
II. Documentation and Records		
II. Documentation and Records	**Yes/No**	**Comments**
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals, or notices of intent found?	No	
III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new penetrations or repaved cut marks present at the site?	No	Some minor wear/tear on asphalt surface.
Is there evidence of damage to the remedy?	No	
Any damage or change to area overlying the ESMA?	No	
Any damage to on-site monitoring wells?	No	All wells and stream gauges observed to be in good condition.
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	A vegetation removal event was completed from October 10-11, 2023 to improve access to monitoring wells in wooded areas. The work was coordinated with MassDevelopment and the property owner.
Any signs of increased exposure potential?	No	
IV. Interview #1		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)		
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	

Annual Land Use Control Plan Checklist for AOC 69W

Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	Yes	Retaining wall/sidewalk project planned by charter school is scheduled to be completed in 2024 (see Interview #2).
Were any excavations, planned or emergency, conducted in the Excavated Soils Management Area (ESMA)?	No	
Is drinking water supplied from off-site?	Yes	
Are there any issues with site access for monitoring?	No	
IV. Interview #2		
Name of Interviewer: Ian Martz / Arcadis		
Name of Interviewee: Michelle McKenna - Business Manager, Francis W. Parker Charter Essential School		
Contact information: mmckenna@theparkerschool.org, 978-772-3293		
Interview Notes: Sent email with interview questions on 1/11/2024, received response on 1/11/2024; responses are recorded below.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	
Were any excavations, planned or emergency, conducted in the Excavated Soils Management Area (ESMA)?	Yes	A planned retaining wall/sidewalk project is anticipated to be completed in 2024. The property owner worked with an environmental services company and licensed site professional to develop a soil management plan and health & safety plan, which were submitted for review on 12/21/2023.
Is drinking water supplied from off-site?	Yes	
Are there any issues with site access for monitoring?	No	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for AOC 32 and 43A

I. Site Information		
Site Name/Location: AOC 32/43A	Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls		
Inspection Date: November 28, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE)		
II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals, or notices of intent found?	No	
III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new construction or excavation present in the area of the remedy?	No	
Any damage to on-site monitoring wells?	No	Some minor damage noted (cracked concrete pads, missing bolts, etc.)
Is there evidence of damage to the remedy?	No	
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	
Any signs of increased exposure potential?	No	
IV. Interview #1		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)		
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS. O'Reilly Auto Parts Warehouse is located within the footprint of AOC 32/43A. They are required to submit an annual Stormwater Management O&M Report to Devens Enterprise Commission. The facility also has two monitoring wells which are sampled annually: APEX-MW-OB-1 and APEX-MW-BR-2. The identity of the O'Reilly wells have been included at the request of the USACE. The annual reports are submitted to MassDEP and Devens Enterprise Commission.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	

Annual Land Use Control Plan Checklist for AOC 32 and 43A

Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction or demolition activities at the property?	No	
Are there any issues with site access for monitoring?	No	
IV. Interview #2		
Name of Interviewer: Ian Martz / Arcadis		
Name of Interviewee: John Bounds (O'Reilly Auto Parts), Joe Mrgan (O'Reilly Auto Parts)		
Contact information: jbounds2@oreillyauto.com, 417-520-4589**;** jmrgan@oreillyauto.com, 417-837-5062		
Interview Notes: Sent email with interview questions on 1/11/2024, received response via phone on 3/1/2024; responses are recorded below.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	
Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction or demolition activities at the property?	No	
Are there any issues with site access for monitoring?	No	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for DCL

I. Site Information	
Site Name/Location: DCL	Name/Affiliation: Ian Martz / Arcadis
Remedy Includes: Long Term Monitoring, Institutional Controls	
Inspection Date: October 31, 2023	
Participants: Ian Martz (Arcadis), Brent Smith (USACE)	

II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals, or notices of intent found?	No	

III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of development present in the area of the remedy?	No	
Any damage to on-site monitoring wells?	No	
Is there evidence of damage to the remedy?	No	
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	
Any signs of increased exposure potential?	No	

IV. Interview
Name of Interviewer: Ian Martz (Arcadis)
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.

Annual Land Use Control Plan Checklist for DCL

Item	Yes/No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	
Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	
Are there any issues with site access for monitoring?	X	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Inspection Checklist for DCL Contributor Sites

I. Site Information	
Site Name/Location: DCL Contributor Site AOC 9 Filter Bed Road, Ayer, MA	**Name/Affiliation:** Ian Martz / Arcadis
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2002.	
Use Restrictions: AOC 9 (Lease parcel A2A) is limited to commercial and industrial uses.	
Inspection Date: November 28, 2023	
Participants: Ian Martz (Arcadis), Brent Smith (USACE)	

II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals or notices of intent found?	No	

III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new construction or excavation present in the area of the remedy?	No	
Is there evidence of damage to the remedy?	No	Some tire tracks observed leading to utility lines (gas, electric overhead); no damage to remedy.
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	Easily accessible from Filter Bed Rd.
Any signs of increased exposure potential?	No	

IV. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Inspection Checklist for DCL Contributor Sites

I. Site Information	
Site Name/Location: DCL Contributor Site AOC 40 Patton Road, Ayer, MA	**Name/Affiliation:** Ian Martz / Arcadis
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2002.	
Use Restrictions: AOC 40 (Lease parcel A4) is limited to open space and recreational uses.	
Inspection Date: November 29, 2023	
Participants: Ian Martz (Arcadis), Brent Smith (USACE)	

II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals, or notices of intent found?	No	

III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new construction or excavation present in the area of the remedy?	No	
Is there evidence of damage to the remedy?	No	
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	
Any signs of increased exposure potential?	No	

IV. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Inspection Checklist for DCL Contributor Sites

I. Site Information	
Site Name/Location: DCL Contributor Site SA13 Lake George Street, Harvard, MA	**Name/Affiliation:** Ian Martz / Arcadis
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2001.	
Use Restrictions: SA13 (Lease parcel A8) is limited to commercial and industrial uses.	
Inspection Date: November 29, 2023	
Participants: Ian Martz (Arcadis), Brent Smith (USACE)	

II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals or notices of intent found?	No	

III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new construction or excavation present in the area of the remedy?	No	
Is there evidence of damage to the remedy?	No	
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	
Any signs of increased exposure potential?	No	

IV. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for AOC 43G

I. Site Information	
Site Name/Location: AOC 43G	Name/Affiliation: Ian Martz / Arcadis
Remedy Includes: Long Term Monitoring, Institutional Controls	
Inspection Date: November 29, 2023	
Participants: Ian Martz (Arcadis), Brent Smith (USACE)	

II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Harvard, MA?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals, or notices of intent found?	No	

III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of development present in the area of the remedy?	No	Some renovations being completed to the buildings west of Area 1; no pavement work appears to have been conducted.
Any damage to on-site monitoring wells?	Yes	Some bollards and wooden stakes installed around monitoring wells are in need of replacement/repair; this was observed previously and well repairs will be scheduled during planned future site activities.
Is there evidence of damage to the remedy?	No	
Any groundwater extraction wells present?	No	
Is there sufficient access to the site for monitoring?	Yes	
Any signs of increased exposure potential?	No	

IV. Interview		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Penelope Reddy - USACE		
Contact Information: penelope.w.reddy@usace.army.mil, 978-318-8160		
Interview Notes: Emailed final 2023 LUC forms to Penelope Reddy for review on 1/11/2024 and received response via email on 2/26/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	Yes	

Annual Land Use Control Plan Checklist for AOC 43G

Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	None - property remains part of Fort Devens
Are there any issues with site access for monitoring?	No	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUC's necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for AOC 44-52

I. Site Information		
Site Name/Location: AOCs 44 and 52, Barnum Road Maintenance Yards		
Remedy Includes: 2-foot cap overlain with 4 inches of bituminous pavement		
Inspection Date: November 28, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE)		
II. Documentation and Records		
Item	**Yes/No**	**Comments**
Have facility records been reviewed to determine if any construction or maintenance activities occurred on the site?	No	
a. If so, did these activities impact the remedy?	No	
Have records been reviewed to determine if any spills or other environmental issues have been identified that impact the remedy?	No	
Has the USEPA and MassDEP been notified of any construction or maintenance activities that would impact the remedy?	No	
III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of new penetrations or repaved cut marks present at the site?	Yes	New gas line observed to be installed in eastern part of property.
Is there evidence of damage to the remedy?	No	Minor cracks observed in pavement but no significant damage.
a. Asphalt cover intact?	Yes	
b. Any evidence of erosion?	No	
Is there sufficient access to the site for monitoring?	Yes	Yes - access through open gates.
Any signs of increased exposure potential?	No	
IV. Interview		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Daniel O'Leary (US Army), Christopher Hastings (US Army), Michael King (US Army)		
Contact Information: daniel.j.oleary4.ctr@army.mil, 617-276-6673; christopher.s.hastings2.mil@army.mil, 972-343-4319; michael.j.king61.civ@army.mil; 978-615-6875		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/19/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.		

Annual Land Use Control Plan Checklist for AOC 44-52

Item	Yes/No	Comments
Is interviewee familiar with the LUCs imposed upon the property and documentation of these controls?	Yes	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	
Any excavations, planned or emergency, that may have penetrated through the pavement and/or extended to soils below two feet in depth within the site?	No	
Are there any issues with site access for monitoring?	No	
IV. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	New gas line installed within AOC boundaries in 2023. Jim Verner (MassDevelopment) confirmed with the installer (National Grid) that the depth of the gas line did not extend to soils below two feet in depth.
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUCs necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Annual Land Use Control Plan Checklist for SA 71

I. Site Information		
Site Name/Location: SA 71, Former Railroad Roundhouse		
Remedy Includes: Annual land use control inspections and institutional controls		
Inspection Date: November 28, 2023		
Participants: Ian Martz (Arcadis), Brent Smith (USACE)		
II. Documentation and Records		
Item	**Yes/No**	**Comments**
Any related notices filed with Devens Enterprise Commission?	No	
Any related Department of Public Works permits found?	No	
Any related zoning permits or variances found?	No	
Any related Conservation Commission findings, proposals or notices of intent found?	No	
III. Physical On-Site Inspection		
Item	**Yes/No**	**Comments**
Any evidence of excavation in the Site-Specific Soil Management Area (SSSMA)?	No	
Is there evidence of damage to the property?	No	
Any groundwater extraction wells present?	No	
Any signs of development on the property?	No	
Any change in the use of the property from open space/recreational?	No	
Is there sufficient access to the site for monitoring?	Yes	The gate leading to Plow Shop Pond needs a new chain and lock.
Any signs of increased exposure potential?	No	Minor ground subsidence observed beyond Plow Shop Pond gate (drainage channel).
IV. Interview		
Name of Interviewer: Ian Martz (Arcadis)		
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)		
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929		
Interview Notes: Emailed final 2022 LUC forms for review on 1/17/2024. Performed phone interview on 1/29/2024.		
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.		
Item	**Yes/No**	**Comments**
Is interviewee familiar with the LUCs imposed upon the property and documentation of these controls?	Yes	

Annual Land Use Control Plan Checklist for SA 71

Are there any extraction wells at the property?	No	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	No	
Any excavations, planned or emergency, that may have extended into the soil surface within the soil disturbance restriction boundary?	No	
a. If yes, did the Army (or its designee) distribute the SSSMP to all construction and/or utility personnel to follow for the management of potentially contaminated soil?	N/A	
b. If yes, was the construction-related or intrusive soil activity that occurred within the SA 71 soil disturbance restriction boundary performed in accordance with the requirements set forth in the SSSMP?	N/A	
Are there any issues with site access for monitoring?	No	
V. Response Actions		
Item	**Yes/No**	**Comments**
Were violations of the LUCs present ?	No	
Are there Response Actions necessary based on the violations?	No	
Are modifications/ terminations of LUCs necessary?	No	
Have Enforcement Actions been taken during this reporting period?	No	

Appendix G

DCL Inspection Report

DRAFT

United States Army Corps of Engineers
New England District

Appendix G – 2023 Geotechnical Engineering Annual Inspection Report

Devens Consolidation Landfill 2023 Annual Operations, Maintenance, and Monitoring Report, Main Post Former Fort Devens Army Installation Devens, Massachusetts

Contract No. W912WJ-19-D-0014

March 2024

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Attachments

Attachment 1 Photograph Log

Attachment 2 Inspection and Maintenance Checklist

Attachment 3 Landfill Gas Monitoring Log

Acronyms and Abbreviations

DCL	Devens Consolidation Landfill
LEL	lower explosive limit
ppm	part per million
RCRA	Resource Conservation and Recovery Act
S-A JV	SERES-Arcadis 8(a) Joint Venture 2
Tantara	Tantara Corporation

1 Introduction

The Resource Conservation and Recovery Act (RCRA) Subtitle C cap at the Devens Consolidation Landfill (DCL) was constructed with the following objectives:

- Eliminate the potential risk to human health and the environment associated with exposure to wastes
- Minimize off-site migration of contaminants
- Limit infiltration to the underlying waste within the landfill area, thereby minimizing leachate generation.

The landfill cap system was completed during fall 2002 and restoration of site staging areas was completed during spring 2003. The RCRA cap consists of the following layers:

- 12-inch-thick subgrade/leveling layer immediately above the waste materials
- Geocomposite gas collection/vent layer
- 40-mil very flexible polyethylene geomembrane
- Geocomposite drainage layer
- 12-inch-thick protective layer overlaid by an 18-inch-thick vegetative support layer capped with 6 inches of topsoil.

The DCL landfill general plan is shown on Figure 17 of the 2023 Annual Operations, Maintenance, and Monitoring Report, and landfill features are displayed in the attached Photograph Log (Attachment 1). Post-closure monitoring objectives and procedures are specified in the Operation and Maintenance Manual included in the Post-Closure Report. The United States Army Corps of Engineers, New England District, is responsible for operating, monitoring, and inspecting the DCL. Annual operation and maintenance activities include landfill gas monitoring, groundwater sampling, and monthly inspections of the leachate system. Leachate wastewater is permitted to discharge to the Devens wastewater sewer system through the authorized industrial wastewater discharge permit.

2 Landfill Cap Inspection

Personnel from the SERES-Arcadis 8(a) Joint Venture 2, LLC (S-A JV) and the United States Army Corps of Engineers inspected the DCL on October 31, 2023. The cap and adjacent area vegetation were mowed on October 3 to October 11, 2023, by Tantara Corporation of Worcester, Massachusetts (Tantara). Observations were made regarding the site entry, vegetative cover, erosion, settlement, and general condition of the various features. Attachment 2 contains the Inspection and Maintenance Checklist, and Attachment 3 contains the Landfill Gas Monitoring Summary Table, which summarizes the inspection findings.

During the October 2023 inspection, the overall landfill cap and its surrounding perimeter drainage system were found to be in good condition, with no apparent overall settlement and limited evidence of erosion (Attachment 1, Photos 1 through 4). In general, the vegetative cap appeared healthy and is providing good coverage of the cap. As noted during previous inspections, some small, woody shrub species have invaded both the perimeter drainage system and the landfill cap. Woody vegetation was cut as flush to the to the ground as feasible during annual mowing, to promote growth of the grass cover and to prevent deep-rooted vegetation from forming.

2.1 Entries and Exit Inspection

Access roads are located on private property owned by the Massachusetts Development and Finance Agency. The security gate at the Patton Road (southern) entrance was in good condition, though it has observed to be unlocked since personnel from the S-A JV began routine inspections of the DCL in May 2020. The access road from the security gate extending to the leachate pump station was in good condition; no significant ruts, potholes, or eroded areas were observed.

2.2 Fence Inspection

The perimeter fence is in fair condition where it emanates from the security gate. The fence does not encircle the entirety landfill cap, but the fence (along with the security gate and perimeter drainage system) helps to minimize entry onto the landfill cap by motor vehicles. These access limitations appear to be adequate, as there were no signs of vandalism or other unauthorized entry around the west, north, or east perimeter of the landfill.

3 Drainage System Inspection

The perimeter drainage system is designed to drain surface water and infiltrated water off the cap system. It consists of the following components:

- Geocomposite drainage layer
- Grass bench drains on the cap with gabion slope drains
- A perimeter stone drain along the toe-of-slope
- Perimeter drainage channels
- A sediment detention basin with a riprap lined outlet area (located at the northeast corner of the landfill).

During the October 2023 inspection, observations were made regarding the vegetative cover, vegetation types, erosion, and general condition of the drainage system. No maintenance activities were performed during the inspection; however, vegetation removal was conducted as needed within the riprap during the mowing event on October 3 to 11, 2023. Attachment 2 contains the Inspection and Maintenance Checklist, which summarizes the findings of this inspection.

The cap drainage system was observed to be in good condition. Drainage channels were overall free of sediment and debris, with no significant settlement or stone displacement. The gabion slope drains were in good condition, with minimal vegetation present (Attachment 1, Photo 5 and 6). Minor damage was observed to a small section of wire in two of the northern gabion slope drains; this was likely caused by the mowing equipment and will be repaired during a future site visit. No significant vegetation remnants were present within the riprap. The perimeter toe drains were in good condition and appeared to be functioning properly, with no visible signs of erosion or developing slope stability problems.

The detention basin (northeast of the DCL) was in good condition overall (Attachment 1, Photo 7 and 8). Its pond drains, culvert, and outfall areas were in good condition and generally free of both debris and vegetative growth. The area should continue to be monitored for potential future erosion. If significant erosion occurs, then the area should be regraded and reseeded as part of annual landfill maintenance.

4 Gas Vent System Inspection

The DCL includes a passive gas venting system that was installed to facilitate the ventilation of any gases generated from the degrading waste material beneath the landfill cap system. The passive system consists of 11, 6-inch-diameter gas vents (V-1 to V-11) integrated into the geocomposite gas collection layer immediately beneath the 40-mil very flexible polyethylene geomembrane, and three landfill gas monitoring wells (LFGM-18-01 to LFGM-18-03) located between the landfill cap and the TaraVista Behavioral Health building, which is located at 85 Patton Road. The gas vent system was observed to be in good condition; all the gas vents were stable and upright, and all the bird/insect screens on the vents were in good condition (Photo 9). Landfill gas monitoring well LFGM-18-01 was observed to be missing its protective roadbox lid during the previous inspection conducted in 2022 (Photo 10); this was likely a result of mowing activities. A new roadbox lid was later installed in November 2023, and the landfill gas monitoring wells were otherwise observed to be in good condition.

During the October 2023 inspection, all gas vents and landfill gas monitoring points were monitored via two instruments for parameters of interest. A MultiRAE+ multi-gas monitor was used to check levels of volatile organic compounds, hydrogen sulfide, carbon monoxide, percent lower explosive limit (LEL), and oxygen. A Landtec GEM 2000 landfill gas monitor was used to check levels of oxygen, carbon dioxide, methane, and carbon monoxide. As shown in Attachment 3, gas monitoring showed that the parameters of interest ranged as follows:

- Via the MultiRAE+:
  - Volatile organic compounds – 0.0 parts per million (ppm; non-detect) to 0.3 ppm
  - Hydrogen sulfide – 0.0 ppm at all locations
  - Carbon monoxide – 0.0 ppm at all locations
  - LEL – 0.0% at all locations
  - Oxygen – 12.9% to 20.9%
- Via the Landtec GEM 2000:
  - Oxygen – 13.7% to 21.4%
  - Carbon dioxide – 0.0% to 4.9%
  - Methane – 0.0% at all locations
  - Carbon monoxide – 0.0% to 0.1%

5 Recommendations and Corrective Actions

The following recommendations and corrective actions should be conducted for future maintenance of the landfill cap:

1. Continue the annual inspection of landfill cap components. The inspection should continue to be performed in the fall, soon after mowing is completed (i.e., within 1 to 2 weeks), and preferably within 48 hours after a precipitation event to help inspect the effectiveness of surface runoff in the drainage swales. Landfill gas monitoring should be performed on a dry day.
2. Continue mowing the landfill cap annually to control vegetative growth, as well as the adjacent stormwater detention pond to prevent woody and wetland plant species from encroaching onto the cap. Mowing should

not take place prior to September 1, when ground-nesting songbirds are mature enough to avoid being harmed.

3. Continue general landfill maintenance, such as clearing large/woody vegetative growth from the cap, drainage channels, and riprap. Small shrubs growing on the landfill cap should continue to be cut as flush to the ground as feasible during annual maintenance events.
4. Since the cap was completed in 2002, post-closure inspection and monitoring has been performed for 22 years. Planning should commence for the performance time and metrics to reduce long-term monitoring and sampling activities, or to perform them at a reduced frequency, after 30 years, in accordance with RCRA Subtitle C landfill cap regulations for post-closure monitoring periods of performance.

Attachment 1

Photograph Log

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)

Photograph: 1

Description: Photo taken on top of the landfill cap (looking northwest) displaying general site conditions.

Location: DCL

Photograph taken by:
Ian Martz

Date:

October 31, 2023

Photograph: 2

Description: Photo taken of the southern side of the landfill (looking east), displaying general site conditions.

Location: DCL

Photograph taken by:
Ian Martz

Date:

October 31, 2023

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)

Photograph: 3

Description: Photo taken of the northern slope of the landfill cap (looking west), displaying general site conditions.

Location: DCL

Photograph taken by: Ian Martz

Date:

October 31, 2023

Photograph: 4

Description: Photo taken of the eastern slope of the landfill cap (looking north), displaying general site conditions.

Location: DCL

Photograph taken by: Ian Martz

Date:

October 31, 2023

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)

Photograph: 5

Description: Photo taken of a northern gabion slope drain (looking south).

Location: DCL

Photograph taken by:
Ian Martz

Date:
October 31, 2023

Photograph: 6

Description: Photo taken of the southern gabion slope drain, looking south towards the entrance gate and Patton Rd.

Location: DCL

Photograph taken by:
Ian Martz

Date:
October 31, 2023

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)

Photograph: 7

Description: Photo taken of the detention basin, looking west towards the landfill cap.

Location: DCL

Photograph taken by:
Ian Martz

Date:
October 31, 2023

Photograph: 8

Description: Photo of taken of the eastern landfill slope, looking east towards the leachate collection system and detention basin.

Location: DCL

Photograph taken by:
Ian Martz

Date:
October 31, 2023

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)

Photograph: 9

Description: Photo taken of Landfill Gas Vent #4.

Location: DCL

Photograph taken by:
Ian Martz

Date:
October 31, 2023

Photograph: 10

Description: Photo taken of damaged landfill gas monitoring well LFGM-18-01. A new roadbox cover was later installed in November 2023.

Location: DCL

Photograph taken by:
Brent Smith

Date:

October 31, 2023

Attachment 2

Inspection and Maintenance Checklist

US Army Corps of Engineers®
New England District

Inspection & Maintenance Check List
Devens Consolidation Landfill

Inspectors: Ian Martz (JV), Brent Smith (USACE)
Date: 10/31/2023

Item	Description of Inspection Items	Checked (X)	Comments
Landfill Cap	Inspect for Eroded Areas	X	Minor spots of bare soil from mowing activities, but no significant eroded areas observed.
	Inspect for Settlement and Ponded Water	X	No significant settlement or ponded water observed.
	Inspect for Wetland Species Encroachment	X	No wetland species encroachment observed.
	Inspect Vegetated Areas	X	Landfill cap mowed from October 3 to October 11, 2023. The vegetative cap appears healthy and provides good coverage of the cap. No evidence of large vegetation (>2 inches in diameter). Small shrubs (<2 inches in diameter) removed by Tantara during mowing to the extent practical. No significant ruts observed on cap slopes. No large animal burrows observed.
Drainage System	Inspect Stone Toe Drain	X	Toe drain is in good condition.
	Inspect Gabion Slope Drains	X	Slope drains are in good condition; little to no vegetation observed.
	Inspect for Eroded Areas	X	No evidence of significant erosion.
	Inspect for Debris & Unwanted Vegetation in Drainage Channels	X	Good condition; small shrubs roots <2 inches in diameter) removed during mowing by Tantara
	Inspect Rip-Rap Areas	X	Vegetation and growth removed to the extent practical by Tantara.
Gas Vent System	Gas Monitoring Vents V-1 through V-11 and LFGM-18-01 to 18-03	X	The gas vent system was observed to be in good condition. One landfill gas monitoring location (LFGM-18-01) was observed to be missing the protective roadbox lid, which was likely removed inadvertently by the mowing equipment. A replacement roadbox lid will be installed in a future site visit. All gas vents and landfill gas monitoring wells were measured for landfill gas parameters.
	Inspect Vent Pipes and Bird Screens	X	All gas vents were stable, and screens were in good condition.
Monitoring Wells	Inspect for Damage	X	The monitoring wells were observed to be in good condition; no repairs required.
Security Fence	Inspect for Damage to or Breaches in Fencing	X	No damage to the fencing observed.
Access Road	Inspect for Erosion, Potholes and Rutting	X	No damage to the access road observed.

Description of Maintenance Activities Performed (as necessary):

1. Conducted landfill mowing from October 3 to October 11, 2023, including removal of vegetation within the rip-rap areas.
2. Inspected gas vents and collected landfill gas readings.

The following maintenance and monitoring activities are recommended:

1. Continue mowing the landfill cap annually to control vegetative growth, as well as the adjacent stormwater detention pond to prevent woody and wetland plant species from encroaching onto the cap.
2. Continue annual inspections and general landfill maintenance, such as clearing large/woody vegetative growth from the cap, drainage channels, and rip-rap areas.
3. Replace roadbox on landfill gas monitoring well LFGM-18-01.

Attachment 3

Landfill Gas Monitoring Log

Landfill Gas Monitoring
Devens Consolidated Landfill - Devens, Massachusetts

Date: 10/31/2023
Sampler(s): Ian Martz
Weather: fair, mid 40s
Barometer (in-Hg): 29.71 **Time:** 9:15 AM

Location ID	Time	VOC	H_2S	CO	LEL	O_2	O_2	CO_2	CH_4	CO	Remarks
		ppm Multi RAE+	**ppm** Multi RAE+	**ppm** Multi RAE+	**%** Multi RAE+	**%** Multi RAE+	**%** GEM 2000	**%** GEM 2000	**%** GEM 2000	**%** GEM 2000	
V-1	10:29	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	0.0	
V-2	11:10	0.0	0.0	0.0	0.0	20.9	21.3	0.1	0.0	0.0	
V-3	10:33	0.1	0.0	0.0	0.0	20.9	21.0	0.1	0.0	0.0	
V-4	10:58	0.3	0.0	0.0	0.0	20.9	21.2	0.0	0.0	0.0	
V-5	11:04	0.0	0.0	0.0	0.0	20.9	21.2	0.2	0.0	0.0	
V-6	10:38	0.0	0.0	0.0	0.0	20.9	20.8	0.0	0.0	0.1	
V-7	10:21	0.0	0.0	0.0	0.0	20.9	21.1	0.1	0.0	0.0	
V-8	10:08	0.0	0.0	0.0	0.0	20.9	21.1	0.0	0.0	0.0	
V-9	10:44	0.0	0.0	0.0	0.0	20.9	21.0	0.1	0.0	0.0	
V-10	10:54	0.1	0.0	0.0	0.0	20.9	21.4	0.0	0.0	0.0	
V-11	10:50	0.1	0.0	0.0	0.0	20.9	21.3	0.1	0.0	0.0	
LFGM-18-01	11:41	0.0	0.0	0.0	0.0	16.3	16.9	3.9	0.0	0.0	roadbox lid missing
LFGM-18-02	11:32	0.1	0.0	0.0	0.0	12.9	13.7	4.9	0.0	0.0	
LFGM-18-03	11:25	0.1	0.0	0.0	0.0	18.2	18.1	4.0	0.0	0.0	

Calibration Information:

1. Instrument: **RKI GX-6000**; SN # 0057
Calibrated by: Palms Environmental; checked by Ian Martz (JV)

2. Instrument: **Landtec GEM 5000;** SN# 507885
Calibrated by: Palms Environmental; checked by Ian Martz (JV)

Appendix H

Response to Comments

US Army Corps of Engineers ®

New England District
696 Virginia Road
Concord, Massachusetts
01742-2751

Project Name:	Former Fort Devens Army Installation		
Location:	Devens, Massachusetts	Reviewers:	Shawn Lowry (USEPA) and Joanne Dearden (MassDEP)
Document Name: Draft 2023 Annual Operations, Maintenance, and Monitoring Report, Main Post, Former Fort Devens Army Installation, Devens, Massachusetts, May 2024			

No.	Ref. Page / Para.	COMMENT	RESPONSE
		Shawn Lowry (1 July 2024)	
1.	Appendix E	The appendix presents data trend analyses. It appears the analysis was run with total metals at some sites and dissolved at others. For the benefit of the reader, please explain in the text why the analysis was done this way.	All sampling work was completed in accordance with the site-specific RODs and LTMMP, which require either total or dissolved metals analysis only (depending on the site). There are references to the LTMMP in sections related to Appendix E (i.e., section 3.3.1).
2.	Appendix F	Several comments in the LUC inspection checklists, including maintenance recommendations, are not discussed in the body of the report. For example, the notes for AOC 57 state, "Vegetation clearance needed around some monitoring wells"; the checklist for AOCs 32 and 43A note, "Some minor damage noted (cracked concrete pads, missing bolts, etc.)"; the checklist for AOC 43G notes, "Some bollards and wooden stakes installed around monitoring wells are in need of replacement/repair; this was observed previously and well repairs will be scheduled during planned future site activities"; and SA 71 notes, "The gate leading to Plow Shop Pond needs a new chain and lock". EPA suggests adding a "Recommendations" section to the main body of the report to discuss these issues and any proposed follow up actions.	Each of the noted comments has been added to the body of report, where missing. Sections 2.5, 3.4, 4.5, 5.5, 6.7, 7.3, 8.2, and 9.2 have been updated to include recommendations. The Army will plan to update the LTMMP and optimize the overall Main Post field program.
		Joanne Dearden (11 July 2024)	
1.	N/A	MassDEP has reviewed the *2023 Annual Operations and Maintenance Report for the Main Post at the Former Fort Devens Army Installation* dated May 2024. MassDEP does not have any comments on this submittal.	N/A
END OF COMMENTS			