

APPENDIX B

Finfish Tissue Contaminant Sample and Quality Control Data

QA/QC Summary

Rhode Island Sound Pesticide/PCB – Tissue QA/QC SUMMARY
QC Batches 02-025

PROJECT:	Rhode Island Sound Disposal Site Study – Task 7
PARAMETER:	Pesticides/PCB
LABORATORY:	Battelle, Duxbury, MA
MATRIX:	Tissue
SAMPLE CUSTODY:	Twenty-seven tissue samples (leading to 12 composites) were sent to Battelle Duxbury in one container. Battelle collected tissues on September 27, 2001. Samples were delivered to Battelle Duxbury September 28, 2001. The cooler temperatures were recorded at 0.0°C, upon arrival. Samples were stored in walk in freezer until processing began.

QA/QC DATA QUALITY OBJECTIVES:

PEST/ PCB	Reference Method	Blank	Surrogate Recovery	LCS/MS Recovery	SRM % Diff.	Sample Replicate Relative Precision	Achieved Detection Limit
							(ng/g DW)
	General NS&T	< RL, or associated samples >10X blank values	40-125% Recovery	40-120% Recovery for at least 90% of analytes. Must be >5x background level.	PD < 30% from range of certified values on average, certified concentration is SRM must be >3X RL	< 30% RPD for analytes > 3x RL; for at least 90% of the analytes; (Deviations must be documented)	Pesticides ~0.14 – 0.77 PCB ~0.19 – 2.68

METHOD: Tissue samples were extracted for PCB and pesticides following general NS&T methods. Approximately 25g of wet tissue homogenate was spiked with surrogates and extracted two times with dichloromethane using maceration techniques (Tissuemizer). The combined extract was dried over anhydrous sodium sulfate, concentrated, and an aliquot removed for lipid weight determination. The extract was then further concentrated, processed through an alumina cleanup column, concentrated, and further purified by GPC/HPLC. The post-HPLC extract was concentrated, fortified with recovery internal standards and split for analysis. The split intended for PCB/pesticide analysis was solvent exchanged into hexane. Extracts were analyzed using gas chromatography/electron capture detection (GC/ECD), following NS&T methods. Sample data were quantified by the method of internal standards, using the Recovery Internal Standard (RIS) compounds.

**HOLDING
TIMES:** Tissue samples were stored at -20.0°C until compositing and extraction. All samples were extracted within the 1-year holding time.

Samples were prepared for analysis in one analytical batch and were extracted within approximately 4 months of sample collection and analyzed within 40 days of extraction.

Batch	Extraction Date	Analysis Date
02-025	1/17/02	1/30/02 – 2/1/02

BLANKS: A procedural blank (PB) was prepared with the analytical batch. Blanks were analyzed to ensure the sample extraction and analysis methods were free of contamination.

02-025 – No exceedences noted.

Comments – None.

Rhode Island Sound Pesticide/PCB – Tissue QA/QC SUMMARY

QC Batches 02-025

LABORATORY CONTROL SAMPLE (Blank Spike)	A laboratory control sample (LCS) was prepared the analytical batch. The percent recoveries of PCB/Pesticides were calculated to measure data quality in terms of accuracy. 02-025 – No exceedences noted. Comments – None.
MATRIX SPIKES:	A matrix spike (MS) sample was prepared with the analytical batch. The percent recoveries of PCB/Pesticides were calculated to measure data quality in terms of accuracy and precision. Originally two pairs of Matrix Spike/Matrix Spike Duplicate samples were to be done, one of fillet tissue and one of liver tissue. However, due to an oversight in the preparation laboratory this was not done. 02-025 – No exceedences noted. Comments – None.
SURROGATES:	Two surrogate compounds were added prior to extraction, including PCB (34) and PCB (112). The recovery of each surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency). 02-025 – One exceedence noted. Site 69BWF (ZL09) had PCB112 recovered at 134%. Comments – The contamination level in the sample may have influenced the percent recovery. There should be no significant affect on the sample.
DUPPLICATES:	Two pairs of duplicate samples, one for fillets (tissue) and one for liver, were prepared with the analytical batch. The RPD between replicate analyses for PCB/Pesticide is calculated to measure data quality in terms of precision. Exceedences are noted on a wet weight basis. 02-025 – Site 69A (ZS22, fillet tissue) had two exceedences noted, 4,4-DDE had a %RPD of 63.9% and PCB209 had a %RPD of 110.6%. Site 69AWF (ZL10, liver) had three exceedences noted, PCB195 had a %RPD of 31.1%, PCB206 had a %RPD of 38.1%, and PCB 209 had a %RPD of 46.9%. Comments – Most exceedences are related to low-level detection. All other QC are excellent and no further action taken.
SRM:	A standard reference material (SRM, NIST 1974a) was prepared with the analytical batch. The percent difference (PD) between the measured value and the certified range was calculated to measure data quality in terms of accuracy. <i>Note</i> – if the detected value fell within the certified range, then the PD is 0.0%. 02-025 – One exceedence noted. PCB180 was 69.5% different from the certified value. Comments – All other QC are excellent and no further action taken.

Sample Data



Project Name Rhode Island Sound Disposal Site Study - Task 7
 Project Number G487001-T7FISHDUX

Client ID	Site 69A(Composite of Tissue)	Site 69A(Composite of Tissue)	Site 69A(Composite of Tissue)
Battelle ID	ZS19	ZS20	ZS21
Sample Type	Tissue	Tissue	Tissue
Batch ID	02-025	02-025	02-025
Extraction Date	1/17/02	1/17/02	1/17/02
Analysis Date	1/31/02	1/31/02	1/31/02
Moisture Content(%):	77.4	77.5	78.16
Lipid Content(%):	2.971	1.797	2.484
Sample Wet Weight(g):	25.31	27.04	26.57
Sample Dry Weight(g):	5.72	6.08	5.8
Reporting Units	ng/g wet	ng/g wet	ng/g wet
4,4 DDD	0.69	0.53	0.24
4,4 DDE	2.60	3.36	2.18
4,4 DDT	< 0.05 U	< 0.05 U	< 0.05 U
2,4 DDD	0.34	0.31	0.23
2,4 DDE	< 0.18 U	< 0.17 U	< 0.17 U
2,4 DDT	< 0.07 U	< 0.06 U	< 0.06 U
Total DDD	1.03	0.84	0.46
Total DDE	2.60	3.36	2.18
Total DDT	NA	NA	NA
Aldrin	< 0.05 U	< 0.04 U	< 0.04 U
cis Chlordane	0.72	0.20	0.16
Dieldrin	< 0.05 U	< 0.05 U	< 0.05 U
Endosulfan I	< 0.07 U	< 0.06 U	< 0.06 U
Endosulfan II	< 0.10 U	< 0.09 U	< 0.09 U
Endosulfan sulfate	< 0.10 U	< 0.10 U	< 0.10 U
Endrin	< 0.03 U	< 0.03 U	< 0.03 U
g-BHC	< 0.06 U	< 0.06 U	< 0.06 U
Heptachlor	< 0.05 U	< 0.05 U	< 0.05 U
Heptachlor epoxide	< 0.04 U	< 0.04 U	< 0.04 U
Hexachlorobenzene	< 0.08 U	< 0.08 U	0.08 J
Mirex	< 0.08 U	< 0.07 U	0.08 J
Trans-Nonachlor	0.60	0.54	0.44
Toxaphene	< 0.02 U	< 0.01 U	< 0.02 U
Cl2(08)	< 0.64 U	< 0.60 U	< 0.61 U
Cl3(18)	< 0.07 U	< 0.06 U	< 0.07 U
Cl3(28)	0.34	0.24	< 0.09 U
Cl4(44)	0.35	< 0.06 U	< 0.06 U
Cl4(52)	1.03	0.69	0.34
Cl4(66)	1.16	0.96	0.51
Cl5(101)	1.69	3.02	1.71
Cl5(105)	0.48	1.02	0.71
Cl5(118)	2.35	5.22	3.27
Cl6(128)	< 0.18 U	1.29	0.83
Cl6(138)	3.47	6.33	4.59
Cl6(153)	5.12	9.57	6.59
Cl7(170)	0.45	0.58	0.48
Cl7(180)	1.46	1.31	1.28
Cl7(187)	1.19	1.62	1.56
Cl8(195)	< 0.07 U	< 0.07 U	< 0.07 U
Cl9(206)	0.08 J	0.23	0.19
Cl10(209)	0.05 U	0.15	0.10 J
Total PCB	19.71	32.61	22.62

Surrogate Recoveries:

Cl3(34)	71	82	73
Cl5(112)	104	92	83

U = Not detected or concentration < MDL; ssMDL reported

< = MDL



Project Name Rhode Island
 Project Number G487001-T

Client ID	Site 69A(Composite of Tissue)	Site 69B(Composite of Tissue)	Site 69B(Composite of Tissue)
Battelle ID	ZS22	ZS23	ZS24
Sample Type	Tissue	Tissue	Tissue
Batch ID	02-025	02-025	02-025
Extraction Date	1/17/02	1/17/02	1/17/02
Analysis Date	1/31/02	1/31/02	1/31/02
Moisture Content(%):	79.56	78.53	78.62
Lipid Content(%):	1.266	1.827	2.328
Sample Wet Weight(g):	26.38	25.39	20.62
Sample Dry Weight(g):	5.39	5.45	4.41
Reporting Units	ng/g wet	ng/g wet	ng/g wet
4,4 DDD	0.08	J	0.40
4,4 DDE	1.48		1.61
4,4 DDT	< 0.05	U	< 0.05
2,4 DDD	0.16		0.38
2,4 DDE	< 0.17	U	< 0.18
2,4 DDT	< 0.06	U	< 0.07
Total DDD	0.25		0.78
Total DDE	1.48		1.61
Total DDT		NA	NA
Aldrin	< 0.04	U	< 0.05
cis Chlordane	0.22		0.40
Dieldrin	< 0.05	U	< 0.05
Endosulfan I	< 0.06	U	< 0.07
Endosulfan II	< 0.09	U	< 0.10
Endosulfan sulfate	< 0.10	U	< 0.10
Endrin	< 0.03	U	< 0.03
g-BHC	< 0.06	U	< 0.06
Heptachlor	< 0.05	U	< 0.05
Heptachlor epoxide	< 0.04	U	< 0.04
Hexachlorobenzene	0.07	U	0.08
Mirex	< 0.07	U	< 0.08
Trans-Nonachlor	0.29		0.33
Toxaphene	< 0.02	U	< 0.02
Cl2(08)	< 0.61	U	< 0.63
Cl3(18)	< 0.07	U	< 0.07
Cl3(28)	< 0.09	U	0.22
Cl4(44)	< 0.06	U	0.22
Cl4(52)	< 0.04	U	0.55
Cl4(66)	0.30		0.52
Cl5(101)	0.44		1.46
Cl5(105)	0.28		0.38
Cl5(118)	1.10		1.60
Cl6(128)	0.33		0.39
Cl6(138)	1.89		2.51
Cl6(153)	2.58		3.85
Cl7(170)	0.31		0.36
Cl7(180)	0.83		1.18
Cl7(187)	0.81		0.96
Cl8(195)	0.14		< 0.07
Cl9(206)	0.16		U
Cl10(209)	0.09	J	0.09
Total PCB	9.66		14.79
			25.99

Surrogate Recoveries:

Cl3(34)	65	79	84
Cl5(112)	70	88	91

U = Not detected or concentration < 1
 < = MDL



Project Name Rhode Island
Project Number G487001-T

Client ID	Site 69B(Composite of Tissue)	Site NT18(composite of Tissue)	Site NT18(composite of Tissue)
Battelle ID	ZS25	ZS26	ZS27
Sample Type	Tissue	Tissue	Tissue
Batch ID	02-025	02-025	02-025
Extraction Date	1/17/02	1/17/02	1/17/02
Analysis Date	1/31/02	1/31/02	2/1/02
Moisture Content(%):	79.55	79.71	79
Lipid Content(%):	2.266	1.041	1.567
Sample Wet Weight(g):	25.42	24.98	26.81
Sample Dry Weight(g):	5.2	5.07	5.63
Reporting Units	ng/g wet	ng/g wet	ng/g wet
4,4 DDD	0.14	0.16	0.17
4,4 DDE	1.80	1.19	1.79
4,4 DDT	< 0.05 U	< 0.05 U	< 0.05 U
2,4 DDD	0.29	0.18	0.22
2,4 DDE	< 0.18 U	< 0.18 U	< 0.17 U
2,4 DDT	< 0.07 U	< 0.07 U	< 0.06 U
Total DDD	0.43	0.34	0.39
Total DDE	1.80	1.19	1.79
Total DDT	NA	NA	NA
Aldrin	< 0.05 U	< 0.05 U	< 0.04 U
cis Chlordane	0.29	0.24	0.28
Dieldrin	< 0.05 U	< 0.05 U	< 0.05 U
Endosulfan I	< 0.07 U	< 0.07 U	< 0.06 U
Endosulfan II	< 0.10 U	< 0.10 U	< 0.09 U
Endosulfan sulfate	< 0.10 U	< 0.11 U	< 0.10 U
Endrin	< 0.03 U	< 0.03 U	< 0.03 U
g-BHC	< 0.06 U	< 0.06 U	< 0.06 U
Heptachlor	< 0.05 U	< 0.05 U	< 0.05 U
Heptachlor epoxide	< 0.04 U	< 0.04 U	< 0.04 U
Hexachlorobenzene	< 0.08 U	< 0.08 U	< 0.08 U
Mirex	< 0.08 U	0.05 U	0.03 U
Trans-Nonachlor	0.42	0.21	0.35
Toxaphene	< 0.02 U	< 0.02 U	< 0.01 U
Cl2(08)	< 0.63 U	< 0.64 U	< 0.60 U
Cl3(18)	< 0.07 U	< 0.07 U	< 0.06 U
Cl3(28)	< 0.09 U	< 0.09 U	< 0.08 U
Cl4(44)	< 0.06 U	0.13	< 0.06 U
Cl4(52)	0.20	< 0.05 U	< 0.04 U
Cl4(66)	0.36	0.33	0.52
Cl5(101)	0.61	1.29	0.79
Cl5(105)	0.31	0.27	0.33
Cl5(118)	1.49	1.26	1.69
Cl6(128)	0.42	0.33	0.45
Cl6(138)	2.62	2.14	2.92
Cl6(153)	3.56	3.33	4.23
Cl7(170)	0.55	0.37	0.45
Cl7(180)	1.27	0.97	2.09
Cl7(187)	1.39	0.82	1.46
Cl8(195)	< 0.07 U	< 0.07 U	< 0.07 U
Cl9(206)	0.24	0.08 J	0.30
Cl10(209)	0.18	0.07 U	0.16
Total PCB	13.66	11.84	15.86

Surrogate Recoveries:

Cl3(34)	84	73	80
Cl5(112)	90	82	86

U = Not detected or concentration <
< = MDL



Project Name Rhode Island
Project Number G487001-T

Client ID Site 69BWF(Composite of Liver) Site 69AWF(Composite of Liver)

Battelle ID	ZL09	ZL10
Sample Type	Tissue	Tissue
Batch ID	02-025	02-025
Extraction Date	1/17/02	1/17/02
Analysis Date	2/1/02	2/1/02
Moisture Content(%):	62.12	62.3
Lipid Content(%):	24.184	22.822
Sample Wet Weight(g):	21.51	15.13
Sample Dry Weight(g):	8.15	5.7
Reporting Units	ng/g wet	ng/g wet

4,4 DDD	2.16	2.01
4,4 DDE	41.32	28.84
4,4 DDT	4.18	2.01
2,4 DDD	5.27	3.94
2,4 DDE	< 0.21 U	< 0.30 U
2,4 DDT	1.67	< 0.11 U
Total DDD	7.44	5.95
Total DDE	41.32	28.84
Total DDT	5.85	2.01
Aldrin	< 0.05 U	< 0.08 U
cis Chlordane	4.71	4.54
Dieldrin	< 0.06 U	3.91
Endosulfan I	< 0.08 U	< 0.11 U
Endosulfan II	< 0.11 U	< 0.16 U
Endosulfan sulfate	< 0.12 U	< 0.18 U
Endrin	< 0.04 U	< 0.06 U
g-BHC	0.57	< 0.10 U
Heptachlor	< 0.06 U	< 0.09 U
Heptachlor epoxide	< 0.04 U	< 0.06 U
Hexachlorobenzene	< 0.09 U	1.71
Mirex	< 0.09 U	< 0.13 U
Trans-Nonachlor	7.43	6.37
Toxaphene	< 0.02 U	< 0.03 U
Cl2(08)	< 0.75 U	< 1.06 U
Cl3(18)	< 0.08 U	< 0.11 U
Cl3(28)	4.15	2.81
Cl4(44)	2.62	< 0.10 U
Cl4(52)	3.14	1.63
Cl4(66)	10.98	7.22
Cl5(101)	10.53	3.17
Cl5(105)	7.28	4.90
Cl5(118)	35.90	25.79
Cl6(128)	7.15	5.01
Cl6(138)	58.95	42.23
Cl6(153)	88.35	67.51
Cl7(170)	7.55	4.31
Cl7(180)	29.86	19.64
Cl7(187)	25.49	17.78
Cl8(195)	4.30	3.16
Cl9(206)	4.57	3.32
Cl10(209)	3.76	2.45
Total PCB	304.99	211.57

Surrogate Recoveries:

Cl3(34)	94	88
Cl5(112)	134 N	95

U = Not detected or concentration < 1
< = MDL



Project Name Rhode Island
Project Number G487001-T

Client ID Site 16,18 North Tow-WF(Composite of Liver)

Battelle ID	ZL11
Sample Type	Tissue
Batch ID	02-025
Extraction Date	1/17/02
Analysis Date	2/1/02
Moisture Content(%):	66.93
Lipid Content(%):	18.919
Sample Wet Weight(g):	10.73
Sample Dry Weight(g):	3.55
Reporting Units	ng/g wet

4,4 DDD	2.45
4,4 DDE	29.30
4,4 DDT	2.48
2,4 DDD	3.81
2,4 DDE	< 0.43 U
2,4 DDT	< 0.16 U
Total DDD	6.26
Total DDE	29.30
Total DDT	2.48
Aldrin	< 0.11 U
cis Chlordane	4.55
Dieldrin	< 0.12 U
Endosulfan I	< 0.15 U
Endosulfan II	< 0.23 U
Endosulfan sulfate	6.16
Endrin	< 0.08 U
g-BHC	< 0.14 U
Heptachlor	< 0.13 U
Heptachlor epoxide	0.69
Hexachlorobenzene	< 0.19 U
Mirex	0.60
Trans-Nonachlor	6.29
Toxaphene	< 0.04 U
Cl2(08)	< 1.50 U
Cl3(18)	< 0.16 U
Cl3(28)	2.89
Cl4(44)	< 0.14 U
Cl4(52)	2.79
Cl4(66)	4.09
Cl5(101)	7.28
Cl5(105)	6.41
Cl5(118)	31.25
Cl6(128)	7.10
Cl6(138)	51.43
Cl6(153)	77.44
Cl7(170)	6.03
Cl7(180)	27.71
Cl7(187)	21.95
Cl8(195)	1.24
Cl9(206)	5.74
Cl10(209)	4.58
Total PCB	258.83

Surrogate Recoveries:

Cl3(34)	88
Cl5(112)	99

U = Not detected or concentration < 1
< = MDL

Quality Control Data



Procedural Blank Data

Project Name Rhode Island Sound Disposal Site Study - Task 7
Project Number G487001-T7FISHDUX

Client ID NA

Battelle ID ZS11PB
Sample Type NA
Batch ID 02-025
Extraction Date 1/17/02
Analysis Date 1/30/02
Moisture Content(%): 66.63
Lipid Content(%): NA
Sample Wet Weight(g): 23.00
Sample Dry Weight(g): 6.00
Reporting Units ng/g dry

4,4 DDD	< 0.29 U
4,4 DDE	< 0.25 U
4,4 DDT	< 0.18 U
2,4 DDD	< 0.19 U
2,4 DDE	< 0.66 U
2,4 DDT	< 0.24 U
Total DDD	< 0.00 U
Total DDE	< 0.00 U
Total DDT	< 0.00 U
Aldrin	< 0.17 U
cis Chlordane	< 0.15 U
Dieldrin	< 0.18 U
Endosulfan I	< 0.24 U
Endosulfan II	< 0.35 U
Endosulfan sulfate	< 0.38 U
Endrin	< 0.12 U
g-BHC	< 0.22 U
Heptachlor	< 0.20 U
Heptachlor epoxide	< 0.14 U
Hexachlorobenzene	< 0.29 U
Mirex	< 0.27 U
Trans-Nonachlor	< 0.16 U
Toxaphene	< 0.06 U
Cl2(08)	< 2.30 U
Cl3(18)	< 0.25 U
Cl3(28)	< 0.32 U
Cl4(44)	< 0.22 U
Cl4(52)	< 0.17 U
Cl4(66)	< 0.21 U
Cl5(101)	< 0.16 U
Cl5(105)	< 0.30 U
Cl5(118)	< 0.26 U
Cl6(128)	< 0.64 U
Cl6(138)	< 0.26 U
Cl6(153)	< 0.48 U
Cl7(170)	< 0.26 U
Cl7(180)	< 0.26 U
Cl7(187)	< 0.29 U
Cl8(195)	< 0.26 U
Cl9(206)	< 0.24 U
Cl10(209)	< 0.26 U
Total PCB	3.57

Surrogate Recoveries:

Cl3(34)	77
Cl5(112)	80

U = Not detected or concentration < MDL; ssMDL reported

< = MDL



PUTTING TECHNOLOGY TO WORK

Laboratory Control Spike Data

Project Name Rhode Island Sound Disposal Site Study - Task 7
Project Number G487001-T7FISHDUX

Client ID		NA
Battelle ID	ZS12LCS	
Sample Type	NA	
Batch ID	02-025	
Extraction Date	1/17/02	
Analysis Date	1/30/02	
Moisture Content(%):	NA	
Lipid Content(%):	NA	
Sample Wet Weight(g):	1	
Sample Dry Weight(g):	1	
Reporting Units	ng/g dry	% Recovery
	FQ74	
4,4 DDD	60.01	47.24
4,4 DDE	60.00	47.16
4,4 DDT	60.00	57.27
2,4 DDD	60.02	47.73
2,4 DDE	60.19	38.25
2,4 DDT	60.19	27.08
Aldrin	60.02	45.48
cis Chlordane	60.30	47.98
Dieldrin	60.00	48.16
Endosulfan I	60.00	47.57
Endosulfan II	60.01	27.34
Endosulfan sulfate	60.00	40.44
Endrin	60.01	47.78
g-BHC	60.00	45.65
Heptachlor	60.00	48.23
Heptachlor epoxide	60.00	49.91
Hexachlorobenzene	60.00	46.18
Mirex	60.00	49.17
Trans-Nonachlor	60.00	50.30
Toxaphene	NA	NA
Cl2(08)	60.12	60.45
Cl3(18)	60.12	56.27
Cl3(28)	60.00	49.65
Cl4(44)	60.00	48.52
Cl4(52)	60.36	48.67
Cl4(66)	60.00	52.86
Cl5(101)	60.24	51.44
Cl5(105)	60.00	53.26
Cl5(118)	60.12	50.84
Cl6(128)	60.36	51.99
Cl6(138)	60.12	51.98
Cl6(153)	60.12	49.70
Cl7(170)	60.24	49.96
Cl7(180)	60.24	52.45
Cl7(187)	60.00	48.93
Cl8(195)	60.24	48.86
Cl9(206)	60.12	45.81
Cl10(209)	60.00	46.18

Surrogate Recoveries:

CI3(34)
CI5(112)

U = Not detected or concentration < MDL; ssMDL reported
J = Detected at concentration between project QL goal and MDL
- = MDL


Matrix Spike Data

Project Name Rhode Island Sound Disposal Site Study - Task 7
 Project Number G487001-T7FISHDUX

Client ID	Site 69B(Composite of Tissue)	Site 69B(Composite of Tissue)	Site 69B(Composite of Tissue)				
	ZS25	ZS15MS1	ZS16MSD1				
Battelle ID	Tissue	Tissue	Tissue				
Sample Type							
Batch ID	02-025	02-025	02-025				
Extraction Date	1/17/02	1/17/02	1/17/02				
Analysis Date	1/31/02	1/30/02	1/30/02				
Moisture Content(%):	79.55	79.55	79.55				
Lipid Content(%):	2.266	NA	NA				
Sample Wet Weight(g):	25.42	15.41	15.49				
Sample Dry Weight(g):	5.2	3.15	3.17				
Reporting Units	ng/g wet	ng/g wet	ng/g wet				
	FQ74			% Recovery	% Recovery	% RPD	
4,4 DDD	60.01	0.14	3.15	77	2.94	72	6.6
4,4 DDE	60.00	1.80	4.73	75	4.44	68	10.0
4,4 DDT	60.00	< 0.05 U	3.88	100	3.65	94	5.4
2,4 DDD	60.02	0.29	3.21	75	2.98	69	7.5
2,4 DDE	60.19	< 0.18 U	2.64	67	2.84	73	8.0
2,4 DDT	60.19	< 0.07 U	1.68	43	1.73	45	3.5
Total DDD	NA	NA	NA	NA	NA	NA	NA
Total DDE	NA	NA	NA	NA	NA	NA	NA
Total DDT	NA	NA	NA	NA	NA	NA	NA
Aldrin	60.02	< 0.05 U	3.16	81	2.90	75	8.2
cis Chlordane	60.30	0.29	3.55	83	3.26	76	9.0
Dieldrin	60.00	< 0.05 U	3.21	82	3.01	78	5.9
Endosulfan I	60.00	< 0.07 U	2.82	73	2.31	60	19.4
Endosulfan II	60.01	< 0.10 U	2.00	51	2.21	57	10.6
Endosulfan sulfate	60.00	< 0.10 U	3.01	77	2.81	73	6.2
Endrin	60.01	< 0.03 U	3.03	78	2.80	72	7.4
g-BHC	60.00	< 0.06 U	3.07	79	2.84	73	7.3
Heptachlor	60.00	< 0.05 U	3.24	83	3.03	78	6.1
Heptachlor epoxide	60.00	< 0.04 U	3.30	85	3.04	78	7.8
Hexachlorobenzene	60.00	< 0.08 U	3.08	79	2.87	74	6.7
Mirex	60.00	< 0.08 U	3.37	86	3.16	81	6.0
Trans-Nonachlor	60.00	0.42	3.83	88	3.52	80	9.2
Toxaphene	NA	NA	NA	NA	NA	NA	NA
Cl2(08)	60.12	< 0.63 U	3.71	95	4.23	109	13.5
Cl3(18)	60.12	< 0.07 U	3.88	99	3.61	93	6.5
Cl3(28)	60.00	< 0.09 U	3.45	89	3.16	82	8.2
Cl4(44)	60.00	< 0.06 U	3.35	86	3.11	80	6.9
Cl4(52)	60.36	0.20	3.42	82	3.19	77	7.1
Cl4(66)	60.00	0.36	4.12	96	3.75	88	9.6
Cl5(101)	60.24	0.61	4.01	87	3.71	80	8.8
Cl5(105)	60.00	0.31	3.68	86	3.46	81	6.2
Cl5(118)	60.12	1.49	4.50	77	4.28	72	7.0
Cl6(128)	60.36	0.42	3.72	84	3.49	79	6.5
Cl6(138)	60.12	2.62	5.79	81	5.52	75	8.6
Cl6(153)	60.12	3.56	6.78	82	6.56	77	6.4
Cl7(170)	60.24	0.55	3.43	74	2.78	57	24.7
Cl7(180)	60.24	1.27	4.67	87	4.55	84	3.1
Cl7(187)	60.00	1.39	4.38	77	4.16	71	7.4
Cl8(195)	60.24	< 0.07 U	3.48	89	3.33	86	4.0
Cl9(206)	60.12	0.24	3.40	81	3.26	78	4.0
Cl10(209)	60.00	0.18	3.36	81	3.20	78	4.4

Surrogate Recoveries:

Cl3(34)	84	93	86
Cl5(112)	90	82	78

U = Not detected or concentration < MDL; ssMDL reported

J = Detected at concentration between project QL goal and MDL

<= MDL

N = QC value outside of accuracy goal



Sample Duplicate Data

Project Name Rhode Island Sound Disposal Site Study - Task 7
Project Number G487001-T7FISHDUX

Client ID		Site 69AWF(Composite of Liver)	
			% RPD
Battelle ID	ZL10	ZL10Dup	
Sample Type	Tissue	Tissue	
Batch ID	02-025	02-025	
Extraction Date	1/17/02	1/17/02	
Analysis Date	2/1/02	2/1/02	
Moisture Content(%):	62.3	63.51	
Lipid Content(%):	22.822	28.054	
Sample Wet Weight(g):	15.13	10.28	
Sample Dry Weight(g):	5.7	3.75	
Reporting Units	ng/g wet	ng/g wet	
4,4 DDD	2.01	2.67	28.5
4,4 DDE	28.84	29.89	3.6
4,4 DDT	2.01	1.88	6.9
2,4 DDD	3.94	3.98	0.9
2,4 DDE	< 0.30 U	< 0.45 U	NA
2,4 DDT	< 0.11 U	< 0.16 U	NA
Total DDD	5.95	6.65	U NA
Total DDE	28.84	29.89	U NA
Total DDT	2.01	1.88	U NA
Aldrin	< 0.08 U	< 0.11 U	NA
cis Chlordane	4.54	4.91	7.7
Dieldrin	3.91	4.53	14.7
Endosulfan I	< 0.11 U	< 0.16 U	NA
Endosulfan II	< 0.16 U	< 0.24 U	NA
Endosulfan sulfate	< 0.18 U	< 0.26 U	NA
Endrin	< 0.06 U	< 0.08 U	NA
g-BHC	< 0.10 U	< 0.15 U	NA
Heptachlor	< 0.09 U	< 0.13 U	NA
Heptachlor epoxide	< 0.06 U	< 0.09 U	NA
Hexachlorobenzene	1.71	< 0.20 U	NA
Mirex	< 0.13 U	1.10	NA
Trans-Nonachlor	6.37	7.67	18.5
Toxaphene	< 0.03 U	< 0.04 U	NA
Cl2(08)	< 1.06 U	< 1.57 U	NA
Cl3(18)	< 0.11 U	< 0.17 U	NA
Cl3(28)	2.81	3.04	7.8
Cl4(44)	< 0.10 U	< 0.15 U	NA
Cl4(52)	1.63	1.72	5.2
Cl4(66)	7.22	8.17	12.3
Cl5(101)	3.17	2.38	28.7
Cl5(105)	4.90	5.62	13.7
Cl5(118)	25.79	29.63	13.9
Cl6(128)	5.01	< 0.43 U	NA
Cl6(138)	42.23	48.49	13.8
Cl6(153)	67.51	77.73	14.1
Cl7(170)	4.31	5.73	28.3
Cl7(180)	19.64	25.56	26.2
Cl7(187)	17.78	21.23	17.7
Cl8(195)	3.16	4.32	31.1 N
Cl9(206)	3.32	4.88	38.1 N
Cl10(209)	2.45	3.95	46.9 N
Total PCB	211.57	243.61	14.1

Surrogate Recoveries:

Cl3(34)	88	93
Cl5(112)	95	107

U = Not detected or concentration < MDL; ssMDL reported

< = MDL

N = QC value outside accuracy or precision goal

**Sample Duplicate Data**

Project Name Rhode Island Sound Disposal Site Study - Task 7
Project Number G487001-T7FISHDUX

Client ID	Site 69A(Composite of Tissue)	Site 69A(Composite of Tissue)	ng/g wet	% RPD
Battelle ID	ZS22	ZS22Dup		
Sample Type	Tissue	Tissue		
Batch ID	02-025	02-025		
Extraction Date	1/17/02	1/17/02		
Analysis Date	1/31/02	2/1/02		
Moisture Content(%):	79.56	79.88		
Lipid Content(%):	1.266	1.373		
Sample Wet Weight(g):	26.38	25.35		
Sample Dry Weight(g):	5.39	5.1		
Reporting Units			ng/g wet	% RPD
4,4 DDD	0.08 J	0.16	63.9	N
4,4 DDE	1.48	1.77	17.9	
4,4 DDT	< 0.05 U	< 0.05 U	NA	
2,4 DDD	0.16	0.15	9.9	
2,4 DDE	< 0.17 U	< 0.18 U	NA	
2,4 DDT	< 0.06 U	< 0.07 U	NA	
Total DDD	0.25	0.31	22.7	
Total DDE	1.48	1.77	17.9	
Total DDT	NA	NA	NA	
Aldrin	< 0.04 U	< 0.05 U	NA	
cis Chlordane	0.22	0.27	20.9	
Dieldrin	< 0.05 U	0.14	NA	
Endosulfan I	< 0.06 U	< 0.07 U	NA	
Endosulfan II	< 0.09 U	< 0.10 U	NA	
Endosulfan sulfate	< 0.10 U	< 0.10 U	NA	
Endrin	< 0.03 U	< 0.03 U	NA	
g-BHC	< 0.06 U	< 0.06 U	NA	
Heptachlor	< 0.05 U	< 0.05 U	NA	
Heptachlor epoxide	< 0.04 U	< 0.04 U	NA	
Hexachlorobenzene	0.07 U	< 0.08 U	NA	
Mirex	< 0.07 U	0.06 U	NA	
Trans-Nonachlor	0.29	0.38	27.8	
Toxaphene	< 0.02 U	< 0.02 U	NA	
Cl2(08)	< 0.61 U	< 0.63 U	NA	
Cl3(18)	< 0.07 U	< 0.07 U	NA	
Cl3(28)	< 0.09 U	< 0.09 U	NA	
Cl4(44)	< 0.06 U	< 0.06 U	NA	
Cl4(52)	< 0.04 U	< 0.05 U	NA	
Cl4(66)	0.30	< 0.06 U	NA	
Cl5(101)	0.44	0.57	25.6	
Cl5(105)	0.28	0.32	12.8	
Cl5(118)	1.10	1.41	25.2	
Cl6(128)	0.33	0.42	24.7	
Cl6(138)	1.89	2.34	21.5	
Cl6(153)	2.58	2.98	14.5	
Cl7(170)	0.31	0.28	10.7	
Cl7(180)	0.83	1.03	21.9	
Cl7(187)	0.81	0.97	18.3	
Cl8(195)	0.14	< 0.07 U	NA	
Cl9(206)	0.16	0.20	24.3	
Cl10(209)	0.09 J	0.30	110.6	N
Total PCB	9.66	11.33	15.9	

Surrogate Recoveries:

Cl3(34)	65	87
Cl5(112)	70	82

U = Not detected or concentration < MDL; ssMDL reported

< = MDL

N = QC value outside accuracy or precision criteria

**Standard Reference Material 1974a**

Project Name Rhode Island Sound Disposal Site Study - Task 7
Project Number G487001-T7FISHDUX

Client ID	NIST1974a	Surrogate Corrected Data		
Battelle ID	ZS14SRM			
Sample Type	NA			
Batch ID	02-025			
Extraction Date	1/17/02			
Analysis Date	1/30/02			
Moisture Content(%):	89.4			
Lipid Content(%):	NA			
Sample Wet Weight(g):	7.08			
Sample Dry Weight(g):	0.75			
Reporting Units	ng/g dry	% Difference	Ra nge ng/g, dry wt.	
			lower	
4,4 DDD	43.5	0.0	36.7	49.3
4,4 DDE	52.6	0.0	45.7	56.7
4,4 DDT	4.5	0.7	3.32	4.5
cis Chlordane	17.7	0.0	14.4	20
Trans-Nonachlor	21.25	0.0	14.4	21.6
Cl4(44)	86.76	8.3	65.3	80.1
Cl4(52)	122.50	0.0	104	126
Cl4(66)	120.83	14.2	97	105.8
Cl5(101)	156.54	13.4	118.6	138
Cl5(105)	59.24	5.0	49.6	56.4
Cl5(118)	134.60	0.1	127.2	134.4
Cl6(128)	23.83	0.0	18.6	25.4
Cl6(138)	138.99	0.0	124	143
Cl7(180)	35.42	69.5	N	13.3
Cl7(187)	31.80	0.0	31.7	36.3
Surrogate Recoveries:				
Cl3(34)	79			
Cl5(112)	85			

N = QC value outside accuracy or precision criteria

QA/QC Summary

Rhode Island Sound PAH/Phthalate – Tissue QA/QC SUMMARY

QC Batches 02-025

PROJECT:	Rhode Island Sound Disposal Site Study – Task 7
PARAMETER:	PAH
LABORATORY:	Battelle, Duxbury, MA
MATRIX:	Tissue
SAMPLE CUSTODY:	Twenty-seven tissue samples (leading to 12 composites) were sent to Battelle Duxbury in one container. Battelle collected tissues on September 27, 2001. Samples were delivered to Battelle Duxbury September 28, 2001. The cooler temperatures were recorded at 0.0°C, upon arrival. Samples were stored in walk in freezer until processing began.

QA/QC DATA QUALITY OBJECTIVES:

	Reference Method	Surrogate Blank Recovery	LCS/MS Recovery	SRM % Diff.	Sample Replicate Relative Precision	Achieved Detection Limit (ng/g DW)	
PAH	General NS&T	< RL, or associated samples >10X blank values	40-125% Recovery	40-120% Recovery for at least 90% of analytes. Must be >5x background level.	PD < 30% from range of certified values on average, certified concentration is SRM must be >3X RL	< 30% RPD for analytes > 3x RL; for at least 90% of the analytes; (Deviations must be documented)	PAHs ~0.07 – 0.50

METHOD: Tissue samples were extracted for PAHs following general NS&T methods. Approximately 25g of wet tissue homogenate was spiked with surrogates and extracted two times with dichloromethane using maceration techniques (Tissuemizer). A third extraction was then done with dichloromethane and shaker table techniques. The combined extract was dried over anhydrous sodium sulfate, concentrated, and an aliquot removed for lipid weight determination. The extract was then further concentrated, processed through an alumina cleanup column, concentrated, and further purified by GPC/HPLC. The post-HPLC extract was concentrated, fortified with recovery internal standards and split for analysis. The split intended for PAH analysis was analyzed using a gas chromatography/mass spectrometer (GC/MS), following NS&T methods. Sample data were quantified by the method of internal standards, using the Recovery Internal Standard (RIS) compounds.

HOLDING TIMES: Tissue samples were stored at -20.0°C until compositing and extraction. All samples were extracted within the 1-year holding time.

Samples were prepared for analysis in one analytical batch and were extracted within approximately 4 months of sample collection and analyzed within 40 days of extraction.

Batch	Extraction Date	Analysis Date
02-025	1/17/02	2/18/02 – 2/23/02

BLANKS: A procedural blank (PB) was prepared with the analytical batch. Blanks were analyzed to ensure the sample extraction and analysis methods were free of contamination.

02-025 – Four analytes were detected at levels above the MDL but below the RL (Flourene, Phenanthrene, Chrysene, and Bis(2-ethylhexyl)phthalate). These concentrations made it necessary to qualify sample data with a “B” if the concentration of these compounds were

Rhode Island Sound PAH/Phthalate – Tissue QA/QC SUMMARY

QC Batches 02-025

not greater than 10x the blank concentration.

Comments – Samples qualified appropriately.

LABORATORY CONTROL SAMPLE (Blank Spike) A laboratory control sample (LCS) was prepared the analytical batch. The percent recoveries of PAH were calculated to measure data quality in terms of accuracy.

02-025 – One exceedence noted. Bis(2-ethylhexyl)phthalate was recovered at 38.1%

Comments – All PAH recoveries were within acceptance criteria.

MATRIX SPIKES: Two pairs of matrix spike/matrix spike duplicate samples, one for phthalate, one for PAHs, were prepared with the analytical batch. The percent recoveries of phthalate and PAHs were calculated to measure data quality in terms of accuracy and precision. Originally 4 pairs of matrix spike/matrix spike duplicates were supposed to be done, a set for PAH and phthalate, and a set for both tissue types, fillet and liver. However, due to an oversight in the preparation lab, this was not done.

02-025 – No exceedences noted.

Comments – None.

SURROGATES: Three surrogate compounds were added prior to extraction, including Naphthalene-d8, Phenanthrene-d10, and Chrysene-d12. The recovery of each surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency).

02-025 – No exceedences noted.

Comments – None.

DUPLICATES: Two pairs of duplicate samples, one for liver and one for fillet, were prepared with the analytical batch. The RPD between replicate analyses for PAH is calculated to measure data quality in terms of precision. Exceedences are noted on a dry weight basis.

02-025 – Site 69A (ZS22, fillet) had one exceedence noted, Naphthalene had a %RPD of 49.7%.

Site 69AWF (ZL10, liver) had two exceedences noted, Acenaphthylene had a %RPD of 57% and Fluorene had a %RPD of 125%.

Comments – Most exceedences are related to low-level detection. All other QC are excellent and no further action taken.

SRM: A standard reference material (SRM, NIST 1974a) was prepared with the analytical batch. The percent difference (PD) between the measured value and the certified range was calculated to measure data quality in terms of accuracy. **Note** – if the detected value fell within the certified range, then the PD is 0.0%.

02-025 – Six exceedences noted.

Comments – All other QC are excellent and the analysis of the non-fractionated extract yielded similar results. No further action taken.

Sample Data



Project Name Rhode Island Sound Disposal Site Study-Task 7
Project Number G487001-T7FISHDUX

Client Sample ID	Site 69BWF(Composite of liver)	Site 69 AWF(Composite of liver)	Site 16,18 North Tow-WF(Composite of liver)
Battelle Sample ID	ZL09-B	ZL10-B	ZL11-B
Battelle Batch ID	02-025	02-025	02-025
Associated Blank	ZS11PB-B	ZS11PB-B	ZS11PB-B
Sample Type	LIVER	LIVER	LIVER
Data File	C4420.D	C4423.D	C4429.D
Extraction Date	01/17/02	01/17/02	01/17/02
Analysis Date	02/23/02	02/23/02	02/24/02
Percent Moisture (%)	62.12	62.30	66.93
Sample Wet Weight (g)	21.51 g	15.13 g	10.73 g
Sample Dry Weight (g)	8.15 g	5.7 g	3.55 g
Lipid Content(g/g wet weight)	0.24184	0.22822	0.18919
Units - ng/g (wet weight)	ng/g	ng/g	ng/g
Naphthalene	7.62 B	8.99 B	13.2 B
Acenaphthylene	0.611	1.54	1.47
Acenaphthene	< 0.0505 U	2.18	3.63
Fluorene	6.95	38.5	101
Phenanthrene	2.17 B	2.91 B	3.95 B
Anthracene	0.664	0.902	1.28
Fluoranthene	0.641 J	< 0.689 U	0.963 BU
Pyrene	0.363 J	< 0.448 U	< 0.632 U
Chrysene	< 0.0572 U	< 0.0813 U	< 0.115 U
Bis(2-ethylhexyl)phthalate	5.97 BU	21.2 J	15.7 J
Benzo(b)fluoranthene	< 0.0396 U	< 0.0562 U	< 0.0793 U
Benzo(k)fluoranthene	< 0.0461 U	< 0.0656 U	< 0.0925 U
Benzo(a)pyrene	< 0.0547 U	< 0.0778 U	< 0.11 U
Perylene	0.79 B	1.08 B	2.12 B
Indeno(1,2,3-c,d)pyrene	< 0.0209 U	< 0.0297 U	< 0.0419 U
Dibenz(a,h)anthracene	< 0.0373 U	< 0.053 U	< 0.0747 U
Benzo(g,h,i)perylene	< 0.0284 U	< 0.0404 U	< 0.057 U

Surrogate Recoveries (%)

Naphthalene-d8	67	87	76
Phenanthrene-d10	75	93	72
Chrysene-d12	71	93	88

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal, but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
Project Number G487001-T7FISHDUX

Client Sample ID	Site 69B (Composite of tissue)	Site NT18 (Composite of tissue)	Site NT18 (Composite of tissue)
Battelle Sample ID	ZS25-B	ZS26-B NF	ZS27-B
Battelle Batch ID	02-025	02-025	02-025
Associated Blank	ZS11PB-B	ZS11PB-B	ZS11PB-B
Sample Type	FILET	FILET	FILET
Data File	C4381.D	C4382.D	C4383.D
Extraction Date	01/17/02	01/17/02	01/17/02
Analysis Date	02/21/02	02/21/02	02/21/02
Percent Moisture (%)	79.55	79.71	79.00
Sample Wet Weight (g)	25.42 g	24.98 g	26.81 g
Sample Dry Weight (g)	5.2 g	5.07 g	5.63 g
Lipid Content(g/g wet weight)	0.02266	0.01041	0.01567
Units - ng/g (wet weight)	ng/g	ng/g	ng/g
Naphthalene	3.29 B	6.42 B	5.04 B
Acenaphthylene	0.079 J	0.0943 J	0.0699 J
Acenaphthene	0.153	0.276	< 0.0405 U
Fluorene	0.166 J	0.679	0.114 J
Phenanthrene	1.09 B	1.62 B	1.23 B
Anthracene	0.0592 J	0.143 J	0.0692 J
Fluoranthene	0.179 BU	0.209 BU	0.171 BU
Pyrene	0.131 BU	0.195 BU	0.184 BU
Chrysene	0.0782 J	0.115 J	0.0974 J
Bis(2-ethylhexyl)phthalate	2.91 BU	8.89 BU	4.3 BU
Benzo(b)fluoranthene	< 0.0335 U	< 0.0487 U	< 0.0317 U
Benzo(k)fluoranthene	< 0.039 U	< 0.0568 U	< 0.037 U
Benzo(a)pyrene	< 0.0463 U	< 0.0674 U	< 0.0439 U
Perylene	< 0.04 U	< 0.0583 U	< 0.038 U
Indeno(1,2,3-c,d)pyrene	< 0.0177 U	< 0.0258 U	< 0.0168 U
Dibenz(a,h)anthracene	< 0.0315 U	< 0.0459 U	< 0.0299 U
Benzo(g,h,i)perylene	< 0.024 U	< 0.035 U	< 0.0228 U

Surrogate Recoveries (%)

Naphthalene-d8	78	73	73
Phenanthrene-d10	77	69	71
Chrysene-d12	86	75	80

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal,
but meets contingency criteria.

N=QC value outside accuracy or precision goal.

Quality Control Data



Project Name Rhode Island Sound Disposal Site Study-Task 7
Project Number G487001-T7FISHDUX

Client Sample ID		Lab Control Sample		Lab Control Sample 2
Battelle Sample ID		ZS12LCS-B		ZS13LCS2-B
Battelle Batch ID		02-025		02-025
Associated Blank		ZS11PB-B		ZS11PB-B
Sample Type		NA		NA
Data File		C4295.D		C4296.D
Extraction Date		01/17/02		01/17/02
Analysis Date		02/18/02		02/18/02
Percent Moisture (%)		NA		NA
Sample Wet Weight (g)		NA		NA
Sample Dry Weight (g)		NA		NA
Lipid Content		NA		NA
Units	FN73	ng	% Rec Q	FM84 ng % Rec Q
Naphthalene	2004	1600	80	117
Acenaphthylene	2008	1630	81	1.94 J
Acenaphthene	2008	1570	78	< 1.04 U
Fluorene	2009	1640	82	2 J
Phenanthrene	2014	1680	83	23.6 J
Anthracene	2011	1690	84	< 0.763 U
Fluoranthene	2008	1780	89	4.12 U
Pyrene	2006	1750	87	3.42 U
Chrysene	2009	1620	81	2.58 J
Bis(2-ethylhexyl)phthalate		55.5 BU		1536.6
Benz(a)bifluoranthene	2007	1630	81	2.38 J
Benz(k)bifluoranthene	2005	1640	82	< 0.946 U
Benz(a)pyrene	2013	1590	79	< 1.12 U
Perylene	2000	1550	77	10.2
Indeno(1,2,3-c,d)pyrene	2007	1650	82	< 0.429 U
Dibenz(a,h)anthracene	2005	1660	83	< 0.765 U
Benz(g,h,i)perylene	2007	1520	76	< 0.563 U
Surrogate Recoveries (%)				
Naphthalene-d8		77		76
Phenanthrene-d10		74		70
Chrysene-d12		80		75

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal,
but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
 Project Number G487001-T7FISHDUX

Client Sample ID		Site 69B (Composite of tissue)	Site 69B (Composite of tissue)	Site 69B (Composite of tissue)			
Battelle Sample ID	ZS25-B	ZS15MS1-B	ZS16MSD1-B				
Battelle Batch ID	02-025	02-025	02-025				
Associated Blank	ZS11PB-B	ZS11PB-B	ZS11PB-B				
Sample Type	FILET	FILET	FILET				
Data File	C4381.D	C4368.D	C4369.D				
Extraction Date	01/17/02	01/17/02	01/17/02				
Analysis Date	02/21/02	02/21/02	02/21/02				
Percent Moisture (%)	79.55	79.55	79.55				
Sample Wet Weight (g)	25.42 g	15.41 g	15.49 g				
Sample Dry Weight (g)	5.2 g	3.15 g	3.17 g				
Lipid Content	NA	NA	NA				
Units - ng/g (dry weight)	FQ74	ng/g	ng/g	ng/g			
		% Rec Q	% Rec Q	RPD			
Naphthalene	2004	3.29 B	100	74	95.3	71	4.14
Acenaphthylene	2008.4	0.079 J	98.8	76	97.4	75	1.32
Acenaphthene	2008.1	0.153	99	76	97.5	75	1.32
Fluorene	2009.4	0.166 J	102	78	99.8	77	1.29
Phenanthrene	2014.1	1.09 B	103	78	98.7	75	3.92
Anthracene	2010.5	0.0592 J	101	77	96.6	74	3.97
Fluoranthene	2008.4	0.179 BU	100	77	96.4	74	3.97
Pyrene	2005.8	0.131 BU	100	77	96.9	75	2.63
Chrysene	2009.2	0.0782 J	104	80	99.8	77	3.82
Bis(2-ethylhexyl)phthalate		2.91 BU	4.39 BU		5.29 BU		
Benz(a)bifluoranthene	2007.4	< 0.0335 U	104	80	102	79	1.26
Benz(k)bifluoranthene	2005.1	< 0.039 U	107	82	101	78	5
Benz(a)pyrene	2012.6	< 0.0463 U	103	79	100	77	2.56
Perylene	2000.4	< 0.04 U	100	77	96.2	75	2.63
Indeno(1,2,3-c,d)pyrene	2006.6	< 0.0177 U	106	81	103	80	1.24
Dibenz(a,h)anthracene	2005.1	< 0.0315 U	106	82	103	80	2.47
Benzo(g,h,i)perylene	2007.3	< 0.024 U	102	78	99.5	77	1.29

Surrogate Recoveries (%)

Naphthalene-d8	78	75	73
Phenanthrene-d10	77	73	71
Chrysene-d12	86	82	79

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal, but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
 Project Number G487001-T7FISHDUX

Client Sample ID	Site 69BWF(Composite of liver)	Site 69BWF(Composite of liver)	Site 69BWF(Composite of liver)		
Battelle Sample ID	ZL09-B 02-025	ZS17MS2-B 02-025	ZS18MSD2-B 02-025		
Battelle Batch ID	ZS11PB-B	ZS11PB-B	ZS11PB-B		
Associated Blank	LIVER	LIVER	LIVER		
Sample Type	C4420.D	C4414.D	C4417.D		
Data File	01/17/02	01/17/02	01/17/02		
Extraction Date	02/23/02	02/23/02	02/23/02		
Analysis Date	62.12	62.12	62.12		
Percent Moisture (%)	21.51 g	10.14 g	10.07 g		
Sample Wet Weight (g)	8.15 g	3.84 g	3.81 g		
Sample Dry Weight (g)	NA	NA	NA		
Lipid Content	FM84	ng/g	% Rec Q	ng/g	% Rec Q
Units - ng/g (dry weight)					RPD
Naphthalene	7.62 B	9.5 B	12.1 B		
Acenaphthylene	0.611	1.38	1.85		
Acenaphthene	< 0.0505 U	2.85	4.36		
Fluorene	6.95	91	98.7		
Phenanthrene	2.17 B	3.22 B	4.27 B		
Anthracene	0.664	1.09	1.31		
Fluoranthene	0.641 J	0.873 BU	1.56 J		
Pyrene	0.363 J	0.759 J	1.27 J		
Chrysene	< 0.0572 U	0.663 B	1.48		
Bis(2-ethylhexyl)phthalate	1536.6	5.97 BU	109 B	68	116 B
Benzo(b)fluoranthene	< 0.0396 U	< 0.08 U	< 0.0806 U		
Benzo(k)fluoranthene	< 0.0461 U	< 0.0933 U	< 0.094 U		
Benzo(a)pyrene	< 0.0547 U	< 0.111 U	< 0.111 U		
Perylene	0.79 B	< 0.0957 U	3.74		
Indeno(1,2,3-c,d)pyrene	< 0.0209 U	< 0.0423 U	< 0.0426 U		
Dibenz(a,h)anthracene	< 0.0373 U	< 0.0754 U	< 0.0759 U		
Benzo(g,h,i)perylene	< 0.0284 U	< 0.0575 U	< 0.0579 U		

Surrogate Recoveries (%)

Naphthalene-d8	67	85	95
Phenanthrene-d10	75	82	94
Chrysene-d12	71	96	104

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the OL goal.

R=QC value outside accuracy or precision criteria goal, but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
 Project Number G487001-T7FISHDUX

Client Sample ID	Site 69 AWF(Composite of liver)	Site 69 AWF(Composite of liver)	
	ZL10-B 02-025 ZS11PB-B LIVER C4423.D 01/17/02 02/23/02 62.3 15.13 g 5.7 g 0.2282 ng/g Q	ZL10DUP-B 02-025 ZS11PB-B LIVER C4426.D 01/17/02 02/23/02 63.51 10.28 g 3.75 g 0.28054 ng/g	RPD
Naphthalene	8.99 B	10.2 B	12.6
Acenaphthylene	1.54	0.832	59.7 N
Acenaphthene	2.18	< 0.106 U	
Fluorene	38.5	8.56	127 N
Phenanthrene	2.91 B	3.06 B	5.03
Anthracene	0.902	0.992	9.5
Fluoranthene	< 0.689 U	< 1.01 U	
Pyrene	< 0.448 U	< 0.659 U	
Chrysene	< 0.0813 U	< 0.12 U	
Bis(2-ethylhexyl)phthalate	21.2 J	14.7 BU	36.2 R
Benzo(b)fluoranthene	< 0.0562 U	< 0.0828 U	
Benzo(k)fluoranthene	< 0.0656 U	< 0.0965 U	
Benzo(a)pyrene	< 0.0778 U	< 0.114 U	
Perylene	1.08 B	1.19 B	9.69
Indeno(1,2,3-c,d)pyrene	< 0.0297 U	< 0.0438 U	
Dibenz(a,h)anthracene	< 0.053 U	< 0.078 U	
Benzo(g,h,i)perylene	< 0.0404 U	< 0.0594 U	

Surrogate Recoveries (%)

Naphthalene-d8	87	82
Phenanthrene-d10	93	82
Chrysene-d12	93	95

B=Result < 10 x PB.

U=Detected below the ssMDL value.

U=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal,
but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
Project Number G487001-T7FISHDUX

Client Sample ID	Site 69 A (Composite of tissue)	Site 69 A (Composite of tissue)		
Battelle Sample ID	ZS22-B	ZS22DUP-B		
Battelle Batch ID	02-025	02-025		
Associated Blank	ZS11PB-B	ZS11PB-B		
Sample Type	FILET	FILET		
Data File	C4376.D	C4377.D		
Extraction Date	01/17/02	01/17/02		
Analysis Date	02/21/02	02/21/02		
Percent Moisture (%)	79.56	79.88		
Sample Wet Weight (g)	26.38 g	25.35 g		
Sample Dry Weight (g)	5.39 g	5.1 g		
Lipid Content	0.01266	0.01373		
Units - ng/g (wet weight)	ng/g	ng/g	RPD	Q
Naphthalene	5.8 B	3.44 B	51.1	N
Acenaphthylene	0.0652 J	< 0.0389 U		
Acenaphthene	< 0.0412 U	< 0.0429 U		
Fluorene	< 0.051 U	0.112 J		
Phenanthrene	1.44 B	1.03 J	33.2	R
Anthracene	< 0.0303 U	< 0.0316 U		
Fluoranthene	0.22 BU	0.149 BU	38.5	R
Pyrene	0.268 J	0.12 BU	76.3	R
Chrysene	0.103 J	0.0695 J	38.8	R
Bis(2-ethylhexyl)phthalate	4.22 BU	2.84 BU	39.1	R
Benzo(b)fluoranthene	< 0.0322 U	< 0.0336 U		
Benzo(k)fluoranthene	< 0.0376 U	< 0.0391 U		
Benzo(a)pyrene	< 0.0446 U	< 0.0464 U		
Perylene	< 0.0386 U	< 0.0402 U		
Indeno(1,2,3-c,d)pyrene	< 0.017 U	< 0.0177 U		
Dibenz(a,h)anthracene	< 0.0304 U	< 0.0316 U		
Benzo(g,h,i)perylene	< 0.0232 U	< 0.0241 U		

Surrogate Recoveries (%)

Naphthalene-d8	53	68
Phenanthrene-d10	51	65
Chrysene-d12	58	72

B=Result < 10 x PB.

U=Detected below the ssMDL value.

J=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal, but meets contingency criteria.

N=QC value outside accuracy or precision goal.



Project Name Rhode Island Sound Disposal Site Study-Task 7
Project Number G487001-T7FISHDUX

Client Sample

ID

Procedural Blank

Battelle Sample ID	ZS11PB-B
Battelle Batch ID	02-025
Associated Blank	NA
Sample Type	NA
Data File	C4294.D
Extraction Date	01/17/02
Analysis Date	02/18/02
Percent Moisture (%)	NA
Sample Wet Weight (g)	22.99
Sample Dry Weight (g)	5.51 g
Lipid Content	NA
Units - ng/g (wet weight)	ng/g

Naphthalene	5.13
Acenaphthylene	< 0.0409 U
Acenaphthene	< 0.0451 U
Fluorene	0.0652 J
Phenanthrene	1.01 J
Anthracene	< 0.0332 U
Fluoranthene	0.129 U
Pyrene	0.128 U
Chrysene	0.0903 J
Bis(2-ethylhexyl)phthalate	15.8 J
Benzo(b)fluoranthene	< 0.0353 U
Benzo(k)fluoranthene	< 0.0412 U
Benzo(a)pyrene	< 0.0488 U
Perylene	0.258
Indeno(1,2,3-c,d)pyrene	< 0.0187 U
Dibenz(a,h)anthracene	< 0.0332 U
Benzo(g,h,i)perylene	0.129

Surrogate Recoveries (%)

Naphthalene-d8	84
Phenanthrene-d10	75
Chrysene-d12	80

B=Result < 10 x PB.

U=Detected below the ssMDL value.

J=Not detected "<" reported with the ssMDL value.

J=Detected between the ssMDL and the QL goal.

R=QC value outside accuracy or precision criteria goal,
but meets contingency criteria.

N=QC value outside accuracy or precision goal.

QA/QC Summary

Rhode Island Sound BUTYLTIN – Tissue QA/QC SUMMARY

QC Batches 02-035

PROJECT:	Rhode Island Sound Disposal Site Study – Task 7
PARAMETER:	Butyltins
LABORATORY:	Battelle, Duxbury, MA
MATRIX:	Tissue
SAMPLE CUSTODY:	Twenty-seven tissue samples (leading to 12 composites) were sent to Battelle Duxbury in one container. Battelle collected tissues on September 27, 2001. Samples were delivered to Battelle Duxbury September 28, 2001. The cooler temperatures were recorded at 0.0°C, upon arrival. Samples were stored in walk in freezer until processing began.

QA/QC DATA QUALITY OBJECTIVES:

	Reference Method	Surrogate Recovery	LCS/MS Recovery	SRM % Diff.	Sample Replicate Relative Precision	Achieved Detection Limit (ng/g DW)
Butyltins	General NS&T	< RL, or associated samples Recovery >10X blank values	30-125% Recovery Recovery for at least 90% of analytes. Must be >5x background level.	30-120% Recovery for at least 90% of analytes. Must be >5x background level.	NA (Deviations must be documented)	< 30% RPD for analytes > 3x RL; for at least 90% of the analytes; Butyltins ~4.17 – 6.85

METHOD: Approximately 25 grams of tissue were spiked with Surrogate Internal Standards to monitor laboratory efficiency then extracted with hexane and the chelating agent tropolone. Following extraction, the cationic butyltin compounds were converted to nonpolar *n*-hexyl derivatives with commercially available *n*-hexylmagnesium bromide via a Grignard reaction. The extract was cleaned utilizing Silica/Florisil gel liquid chromatography column techniques. The butyltins were collected in a conventional hexane eluate from the column. Extracts were concentrated using TurboVap techniques and analyzed by GC/FPD using a tin-specific photometer. The concentrations of target analytes in the samples are calculated relative to the SIS. The overall recovery efficiency of the method is measured by calculating the recovery SIS relative to the recovery internal standard (RIS) dipropyltin (DPT), which is added just prior to GC analysis.

HOLDING TIMES: Tissue samples were stored at -20.0°C until compositing and extraction. All samples were extracted within the 1-year holding time.

Samples were prepared for analysis in one analytical batch and were extracted within approximately 4 months of sample collection and analyzed within 40 days of extraction.

Batch	Extraction Date	Analysis Date
02-035	1/29/02	2/4/02– 2/5/02

BLANKS: A procedural blank (PB) was prepared with the analytical batch. Blanks were analyzed to ensure the sample extraction and analysis methods were free of contamination.

02-035 – Tributyltin was detected in ten samples within 10X the levels detected in the procedural blank. The exceedences are noted on the individual samples.

Comments – The source of the contamination in the procedural blank is likely the derivitizing agent used during the extraction. Some samples may be impacted by this contamination. Impacted sample data was qualified with a “B”.

Rhode Island Sound BUTYLTIN – Tissue QA/QC SUMMARY
QC Batches 02-035

LABORATORY CONTROL SAMPLE (Blank Spike)	A laboratory control sample (LCS) was prepared the analytical batch. The percent recoveries of Butyltins were calculated to measure data quality in terms of accuracy. 02-035 – No exceedences noted. Comments – None.
MATRIX SPIKES:	Two pairs of matrix spike/matrix spike duplicate samples, one for fillet (tissue) and one for liver were prepared with the analytical batch. The percent recoveries of Butyltins were calculated to measure data quality in terms of accuracy and precision. 02-035 – No exceedences noted. Comments – None.
SURROGATES:	Two surrogate compounds were added prior to extraction, including TPT (tripropyltin) and TPET (tripentyltin). The recovery of the TPET surrogate compound was calculated to measure data quality in terms of accuracy (extraction efficiency). 02-035 – Five samples had low surrogate recoveries. Comments – All the low recoveries were in the liver samples. Most likely a matrix related issue.
DUPLICATES:	Two pairs of duplicate samples, one for fillet (tissue) and one for liver, were prepared with the analytical batch. The RPD between replicate analyses for Butyltins is calculated to measure data quality in terms of precision. Exceedences are noted on a dry weight basis. 02-035 – Site 69A (ZS22, fillet tissue) had no exceedences noted. Site 69AWF (ZL10, liver) had one exceedence noted, tributyltin had a %RPD of 46%. Comments –All other QC are excellent and no further action taken.
SRM:	No certified material available. 02-035 – NA. Comments – None.

Analytical Data

Laboratory Name: Battelle
 Project Name: RI Sound Disposal Site Study
 Task 7
 Project Number: G487001-T7FISHDUX
 Batch ID: 02-036
 Extraction SOP: 5-198



Putting Technology To Work

Tissue Sample Data Wet Bulkytins vs TPEI

CLIENT ID	BATTELLE ID	EXTRACTION DATE	ANALYSIS DATE	MOISTURE (%)	WET WEIGHT (g)	LIPIDS (% Wet)	TTBT ng/g	TBT ng/g	DBT ng/g	MBT ng/g	TPET Recovery %
Site 68A (Composite of tissue)	ZS19TBT	01/29/02	02/05/02	77.40	24.69	2.97	< 0.73	U	< 1.11	U	< 0.68
Site 68A (Composite of tissue)	ZS20TBT	01/29/02	02/05/02	77.50	26.00	1.80	< 0.70	U	2.29	B	< 1.05
Site 68A (Composite of tissue)	ZS21TBT	01/29/02	02/05/02	78.16	10.95	2.48	< 1.66	B	< 2.50	U	< 1.52
Site 68A (Composite of tissue)	ZS22TBT	01/29/02	02/05/02	79.55	11.38	1.27	< 1.69	U	4.86	B	< 2.41
Site 68B (Composite of tissue)	ZS23TBT	01/29/02	02/05/02	78.53	19.39	1.83	< 0.94	U	16.39	B	< 1.41
Site 68B (Composite of tissue)	ZS25TBT	01/29/02	02/05/02	79.55	20.34	2.27	< 0.89	U	2.69	B	< 1.35
Site 68 NT 18 (Composite of tissue)	ZS26TBT	01/29/02	02/05/02	79.71	25.71	1.04	< 0.71	U	5.23	B	< 1.07
Site 69 NT 18 (Composite of tissue)	ZS27TBT	01/29/02	02/05/02	79.00	24.43	1.57	< 0.74	U	1.86	B	< 1.12
Site 68BWf (Composite of liver)	ZL09TBT	01/29/02	02/05/02	62.12	9.83	24.18	< 1.85	U	52.96	U	< 0.88
Site 69AWf (Composite of liver)	ZL10TBT	01/29/02	02/05/02	62.30	10.43	22.82	< 1.74	U	40.01	< 1.63	< 1.70
Site 16,18 North Tow-WF (Composite of liver)	ZL11TBT	01/29/02	02/05/02	66.93	5.32	18.92	< 3.41	U	74.97	< 5.15	< 3.14
Site 68A (Composite of tissue)	ZS22DUPTBT	01/29/02	02/05/02	79.88	11.49	1.37	< 1.58	U	4.61	B	< 2.38
Site 69AWf (Composite of liver)	ZL10DUPGBT	01/29/02	02/05/02	63.51	10.27	28.05	< 1.77	U	61.86	< 2.67	< 1.82
Procedural Blank	ZS11LCB	01/29/02	02/04/02	NA	17.00	NA	< 1.07	U	2.79	< 1.61	U
Laboratory Control Sample	ZS12LCB	01/29/02	02/04/02	NA	1.00	NA	387.49	458.93	565.90	85.76	66
Independent Laboratory Control Sample	ZS13LCSD	01/29/02	02/04/02	NA	1.00	NA	275.29	438.91	521.05	132.77	67
Site 68B (Composite of tissue)	ZS14LCSD	01/29/02	02/05/02	NA	1.00	NA	< 18.14	U	437.82	518.23	< 16.68
Site 68B (Composite of tissue)	ZS15MS1	01/29/02	02/05/02	79.55	14.69	2.27	27.52	35.24	35.31	14.59	86
Site 68MSD1	ZS16MSD1	01/29/02	02/05/02	79.55	14.77	2.27	27.90	36.50	35.19	15.15	76
Site 68MSD2	ZS17MSD2	01/29/02	02/05/02	62.12	4.60	24.18	303.97	147.24	123.20	28.96	35
Site 69BWf (Composite of liver)	ZS18MSD2	01/29/02	02/05/02	62.12	4.73	24.18	349.83	147.63	126.49	54.68	24

U - Analyte detected below sample specific MDL

U - Analyte not detected < reported with the sample specific MDL

J - Analyte > MDL < sample specific "Project QL Goal"

B - Analyte detected in PB > RL, sample is < 10 X PB

N - QC value outside DQO

Quality Control									
			TTBT	TBT	DBT	MBT			
Procedural Blank ZS11PB		ng/g < 1.07	U	2.79	< 1.61	U < 0.98	U		
Laboratory Control Sample ZS12LCS	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Laboratory Control Sample Duplicate ZS13LCSD	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Laboratory Control Sample ZS12LCS	Spiked amount recovered (ng)	387.49	458.93	565.90	85.75				
Laboratory Control Sample Duplicate ZS13LCSD	Spiked amount recovered (ng)	275.29	438.91	521.06	132.77				
Laboratory Control Sample ZS12LCS	% Recovery	71	88	110	16				
Laboratory Control Sample Duplicate ZS13LCSD	% Recovery	51	84	101	25				
Average	% Recovery	61	86	105	21				
% RPD	33.9	4.5	8.3	43.0					
Independent Laboratory Control Sample ZS14ILCS	Spiked amount expected (ng)	NA	532.80	511.82	NA				
Independent Laboratory Control Sample ZS14ILCS	Spiked amount recovered (ng)	NA	437.82	518.23	NA				
	% Recovery	NA	82	101	NA				
Site 69B (Composite of tissue) ZS15MS1	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Site 69B (Composite of tissue) ZS16MSD1	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Site 69B (Composite of tissue) ZS15MS1	Spiked amount recovered (ng)	404.24	478.18	518.64	214.27				
Site 69B (Composite of tissue) ZS16MSD1	Spiked amount recovered (ng)	412.04	484.62	519.82	223.72				
	% Recovery	75	92	100	40				
Site 69B (Composite of tissue) ZS15MS1	% Recovery	76	93	101	42				
Site 69B (Composite of tissue) ZS16MSD1	% Recovery	75	92	100	41				
	% RPD	1.9	1.3	0.2	4.3				
Site 69BWF (Composite of liver) ZS17MS2	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Site 69BWF (Composite of liver) ZS18MSD2	Spiked amount expected (ng)	542.00	521.75	516.70	530.55				
Site 69BWF (Composite of liver) ZS17MS2	Spiked amount recovered (ng)	1398.27	493.68	566.70	133.21				
Site 69BWF (Composite of liver) ZS18MSD2	Spiked amount recovered (ng)	1654.68	447.81	598.28	258.63				
	% Recovery	258	83	110	25				
Site 69A (Composite of tissue) ZS22TBT	ng/g < 1.59	U	4.64	B < 2.41	U < 1.47				
Site 69A (Composite of tissue) ZS22DUPTBT	ng/g < 1.58	U	4.61	B < 2.38	U < 1.45				
Average	ng/g	NA	6	NA	NA				
	% RPD	NA	0.7	NA	NA				
Site 69AWF (Composite of liver) ZL10TBT	ng/g < 1.74	U	40.01	< 2.63	U < 1.60				
Site 69AWF (Composite of liver) ZL10DUPTBT	ng/g < 1.77	U	61.86	< 2.67	U < 1.62				
Average	ng/g	NA	50.93	NA	NA				
	% RPD	NA	42.9	N	NA				

U - Analyte detected below sample specific MDL

U Analyte not detected "<" reported with the sample specific MDL

J Analyte > MDL < sample specific "Project QL Goal"

B Analyte detected in PB > RL; sample is < 10 X PB

N QC value outside DQO

QA/QC Summary

QUALITY ASSURANCE STATEMENT

Project Title: USACE/NAE Rhode Island Sound Tissue Dioxin/Furan Data, Batch 1

Project Number: G487001-T7FISHBCL

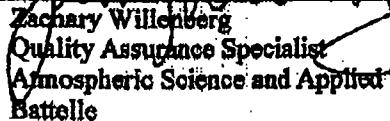
Description of Data: Tissue samples for Dioxin/Furan Data

Description of audit and review activities:

- 1) Reviewed sample preparation Laboratory Record Books (LRB). Tracked COC from sample receipt to analytical injection. Reviewed standard/spike preparation records. Resolved all resulting LRB numbers (i.e. sample tracking numbers) with analytical designations. Reviewed data package for data recording consistent with the QAPP and department SOPs.
- 2) Reviewed analytical (HRMS) data. Reviewed all hand-entered parameters (e.g. sample masses, sample names, calibration curve date, etc) for each analytical run. Reviewed calibrations results to ensure that Relative Response Factors (RRF) were $\pm 20\%$ of calibration RRF. Reviewed 10% data transfer to spreadsheets. Reviewed confirmation runs and accurate data transfer.
- 3) Reviewed spreadsheets. Accessed e-file of excel spreadsheets and reviewed formula and relative and absolute cell addresses to ensure accurate data transposition.
- 4) Reviewed report. Ensured report accurately reflected raw data and resulting spreadsheets.

Description of outstanding issues or deficiencies which may affect data quality:

- 1) Minor QC issues were submitted to the analytical staff for correction, no outstanding issues present.



Zachary Willenberg
Quality Assurance Specialist
Atmospheric Science and Applied Technology
 Battelle

7-15-02

Date

Rhode Island Sound DIOXIN/FURAN TISSUE QA/QC SUMMARY
QC Batch 49170-19

PROJECT: USACE NAE Delivery Order #02 Rhode Island Sound
PARAMETER: Dioxin/Furan by High Resolution Mass Spectrometry (HRMS)
LABORATORY: Battelle, Columbus, OH
MATRIX: Tissue
SAMPLE CUSTODY: Homogenized tissue samples of two types (fish and liver) were received at Battelle Columbus on January 18, 2002. Samples were received in good condition and the cooler temperature upon receipt was 1.2°C.

QA/QC MEASUREMENT PERFORMANCE CRITERIA:

	Reference Method	Blank	Surrogate Recovery	LCS/MS Recovery	% Diff.	SRM	MS/MSD Replicate	Achieved	Project QL Goals ^c
							Relative Precision	EDL (pg/g wet)	(pg/g wet)
Dioxin/ Furan/	L-23 Battelle SOP ASAT.II- 001-02	<5x MDL, or associated samples > 10x blank values	25-150% Recovery	LCS: Method 1613B, Table 6 OPR ^a MS/ MSD: 50-120% Recovery ^b	≤30% PD ^b	≤30% RPD ^{b,d}	Tetras: 0.14 – 0.81	Tetras : 1.07 – 3.36	

^a Method 1613B, Table 6 OPR requirements documented on LCS summary report table.

^b Certified values must be >5x the MDL.

^c values from Table 9b (p 81 of QAPP) adjusted for sample weight and final extract volume.

^d Sample replicate precision: concentrations in sample replicate must be >10x the MDL.

METHOD: Tissue samples were processed and analyzed for seventeen 2,3,7,8-substituted polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) following general procedures in EPA Method 1613 as outlined in the Rhode Island Sound Disposal Site Study, Delivery Order Number 02 QAPP (9/12/01) and as summarized below.

Sample Preparation – The samples were processed in BATCH 49170-19. Aliquots of each homogenized tissue sample were weighed into individual jars and mixed with Hydromatrix drying agent. Approximately 5-10 g wet weight of each tissue sample was used. The six samples plus nine QC samples were prepared for PCDD/PCDF and PCBs. The tissue/hydromatrix mixtures were placed into Soxhlet apparatus and spiked with ¹³C₁₂-labeled PCDD/PCDF and labeled PCB internal standard solutions. Matrix spike, matrix spike duplicate, and laboratory control (LCS) samples were spiked with native PCDD/PCDF and PCB at this time. Note that the samples received internal standard and matrix spike standards at twice the usual level to accommodate the sample being split in half for separate PCB and PCDD/PCDF cleanup.

The Soxhlets were charged with MeCl₂: hexane (1:1) and allowed to extract for a

Rhode Island Sound DIOXIN/FURAN TISSUE QA/QC SUMMARY

QC Batch 49170-19

minimum of 16 hours. The extracts were allowed to cool and drain. Each extract was then spiked with 2,3,7,8-TCDD-³⁷Cl₄ cleanup standard for monitoring recovery of analytes through the cleanup procedures. Each extract was acid washed. After the acid wash step, the samples were split in half with half the extract submitted for PCB cleanup. The remaining extract halves were then processed through acid/base silica, alumina, and carbon cleanup columns. The sediment extracts were spiked with 1,2,3,4-TCDD-¹³C₁₂ and 1,2,3,7,8,9-HxCDD-¹³C₁₂ recovery standard and concentrated to a final sample volume of 20 µL. One sample (2L09) was re-extracted and is reported with this SDG.

PCDD/PCDF Analysis – Each extract was analyzed by gas chromatography/high resolution mass spectrometry (GC/HRMS) in the selected ion-monitoring mode at a resolution of 10,000 or greater. A DB5 column was used for initial analysis of the seventeen 2,3,7,8-PCDD/PCDF; and a DB225 column was used for second column confirmation of 2,3,7,8-TCDF.

The following revisions to Method 1613 as well as several items to note specifically related to these analyses are summarized below:

1. Quality control samples processed with this batch of samples included one method blank, one LCS, one fish standard reference material, one matrix spike for each of the two tissue types, one matrix spike duplicate for each of the two tissue types, and one sample prepared in duplicate for each of the two tissue types.
2. The GC/HRMS instrumentation was calibrated for PCDD/PCDF at levels specified in Method 1613 with one additional calibration standard at concentrations equivalent to $\frac{1}{2}$ the level of Method 1613's lowest calibration point. The calibration range corresponds to the following levels in the samples assuming an average sample wet weight of 5 g of tissue and a final sample volume of 20 µL: 1.0 to 800 pg/g wet for tetra compounds, 5.0 to 4,000 pg/g wet for penta through hepta compounds, and 10 to 8,000 pg/g wet for octa compounds. The calibration range corresponds to the following levels in the samples assuming an average sample wet weight of 2.5 g of tissue and a final sample volume of 20 µL: 2.0 to 1,600 pg/g wet for tetra compounds, 10.0 to 8,000 pg/g wet for penta through hepta compounds, and 20 to 16,000 pg/g wet for octa compounds.

Any additional minor revisions to Method 1613 are fully documented in the analytical record.

HOLDING TIMES: All but sample 2L09 was prepared for analysis in this analytical batch. Samples were extracted the same day they were received at the laboratory and completely analyzed within 2 weeks of extraction.

Batch	Extraction Date	Analysis Date
49170-19	01/18/02	1/30-1/31/2002 2/01/2002 (confirms)

DETECTION LIMITS: Dioxin/furan results are reported relative to the sample-specific estimated detection limit (EDL) for that compound. The sample-specific QL is the project QL goal (found in Table 9b of the QAPP) that has been adjusted for sample specific processing factors and volumes, as follow:

$$QL = (QL_g \times WtQL_g \times \text{dilution factors}) / \text{actual Sample size}$$

Rhode Island Sound DIOXIN/FURAN TISSUE QA/QC SUMMARY

QC Batch 49170-19

Where,

QL_g = QL goal found in Table 9b of QAPP (p. 81)

WtQL_g= weight (g) QL goal found in Table 9b is based upon, 5-g wet

Dilution Factor = documented in project file

Sample Size = actual sample weight

Achieved EDLs met project detection limit goals for target compounds. Results that are below the sample-specific EDL are flagged with a "U" on the summary tables and results that are found to be between the sample-specific EDL and the sample-specific project QL are flagged with a "J".

BLANKS: One laboratory method blank was processed with the analytical batch. Blanks are analyzed to ensure that the sample extraction and analysis methods were free of contamination.

49170-19- Several analytes were detected at a trace level; however, the levels detected were below the EDL with the exception of OCDD. The detected OCDD was found at a concentration below the action level of 5x EDL.

LABORATORY CONTROL SAMPLE: A laboratory control sample (LCS) was prepared with the analytical batch. The percent recoveries of target compounds were calculated to measure data quality in terms of accuracy.

49170-19- The LCS sample met the criteria found in Table 6 of Method 1613, Revision B for PCDD/PCDF.

MATRIX SPIKES: One matrix spike (MS)/matrix spike duplicate (MSD) sample set was prepared for each tissue type with the batch to measure data quality in terms of accuracy and precision. The MS and MSD were fortified with target compounds to monitor data quality in terms of accuracy and precision.

49170-19- For PCDD/PCDF, the matrix spike recoveries for analytes spiked >5x background were within the 50-120% limits for both tissue types. The RPD between duplicates for PCDD/PCDF analytes >5x background ranged from 0 - 6% for both tissue types.

INTERNAL STANDARDS: Fifteen internal standards were added to each sample prior to processing, one standard was added after extraction and prior to sample cleanup. Internal standard recoveries were calculated to measure data quality in terms of accuracy (sample processing efficiency).

49170-19- Recoveries of internal standards were within 25-150% for all analytes in most samples. The percent recoveries for two of the internal standards in the SRM were above the 150% limit.

REPLICATES: A laboratory duplicate was prepared for each tissue type with the batch. The relative percent differences (RPD) between laboratory replicate analyses for target compounds were calculated to measure data quality in terms of precision.

49170-19- None of the analytes were detected above the action level of >10X MDL for the fish tissue duplicates. The RPD for the only analyte above the action level of >10X MDL for the liver tissues was found to meet the ≤30% criteria.

Rhode Island Sound DIOXIN/FURAN TISSUE QA/QC SUMMARY
QC Batch 49170-19

SRM: A standard reference material (CIL EDF 2513) was prepared with the analytical batch. The percent difference (PD) between detected concentrations and certified values was calculated to measure data quality in terms of accuracy.

49170-19— All but five analytes in the SRM were found to be within the limit of 30% difference from consensus values. Most of the five out-of-limit results were only slightly above the limit of 30%.

REFERENCES: Battelle 2001. *Rhode Island Sound Disposal Site Study*. Task 1 QAPP prepared under contract to USACE NAE. Delivery Order #02. September 12, 2001. 408pp + apps.

Sample Data

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL							
	SAMPLE_NO	ZS25							
	Composite Site	69B							
	Tissue Type	Fillet							
	FRACTION	T							
	SAMPLE_SIZE	4.9973							
	SAMPLE_SIZE_UNITS	G WET							
	PCT_LIPID								
	SAMPLE_DATE								
	EXTRACT_DATE	1/18/2002							
	LAB_EXTRACTION_ID	49170-19-02							
	LAB_ID	49037-38-03							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	<0.23	PG/G WET U	0.23	1.08	0.0000	1/30/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	<0.28	PG/G WET U	0.28	12.41	0.0000	1/30/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	<0.21	PG/G WET U	0.21	12.09	0.0000	1/30/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	<0.22	PG/G WET U	0.22	17.50	0.0000	1/30/2002	1.000	
19408-74-3	1,2,3,7,8-HxCDD	<0.20	PG/G WET U	0.20	7.95	0.0000	1/30/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.17	PG/G WET U	0.22	6.04	0.0017	1/30/2002	1.000	
3268-87-9	OCDD	0.72	PG/G WET U	0.22	12.41	0.0007	1/30/2002	1.000	
51207-31-9	2,3,7,8-TCDF	1.35	PG/G WET F	0.29	1.21	0.1350	2/1/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	<0.25	PG/G WET U	0.25	9.87	0.0000	1/30/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	<0.26	PG/G WET U	0.26	7.00	0.0000	1/30/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	<0.21	PG/G WET U	0.21	9.55	0.0000	1/30/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	<0.21	PG/G WET U	0.21	4.77	0.0000	1/30/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	<0.24	PG/G WET U	0.24	8.59	0.0000	1/30/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	<0.22	PG/G WET U	0.22	9.55	0.0000	1/30/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.21	PG/G WET J	0.19	10.19	0.0021	1/30/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.22	PG/G WET U	0.22	7.95	0.0000	1/30/2002	1.000	
39001-02-0	OCDF	0.12	PG/G WET U	0.39	113.27	0.0001	1/30/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	92	PCT_REC				1/30/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	98	PCT_REC				1/30/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	102	PCT_REC				1/30/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	116	PCT_REC				1/30/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	118	PCT_REC				1/30/2002	1.000	
114423-97-1	13C-OCDD	104	PCT_REC				1/30/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	97	PCT_REC F				2/1/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	91	PCT_REC				1/30/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	89	PCT_REC				1/30/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	103	PCT_REC				1/30/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	105	PCT_REC				1/30/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	113	PCT_REC				1/30/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	107	PCT_REC				1/30/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	115	PCT_REC				1/30/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	122	PCT_REC				1/30/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	78	PCT_REC				1/30/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL							
	SAMPLE_NO	ZS22							
	Composite Site	69A							
	Tissue Type	Fillet							
	FRACTION	T							
	SAMPLE_SIZE	5.0217							
	SAMPLE_SIZE_UNITS	G WET							
	PCT_LIPID								
	SAMPLE_DATE								
	EXTRACT_DATE	1/18/2002							
	LAB_EXTRACTION_ID	49170-19-03							
	LAB_ID	49037-38-02							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	0.07	PG/G WET U	0.20	1.08	0.0700	1/30/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	<0.32	PG/G WET U	0.32	12.35	0.0000	1/30/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	<0.30	PG/G WET U	0.30	12.03	0.0000	1/30/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	<0.31	PG/G WET U	0.31	17.41	0.0000	1/30/2002	1.000	
19408-74-3	1,2,3,6,7,8-HxCDD	<0.29	PG/G WET U	0.29	7.92	0.0000	1/30/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	<0.32	PG/G WET U	0.32	6.01	0.0000	1/30/2002	1.000	
3268-87-9	OCDD	0.78	PG/G WET J	0.11	12.35	0.0078	1/30/2002	1.000	
51207-31-9	2,3,7,8-TCDF	1.16	PG/G WET JF	0.24	1.20	0.0012	2/1/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	<0.37	PG/G WET U	0.37	9.82	0.0000	1/30/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	<0.34	PG/G WET U	0.34	6.97	0.0000	1/30/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	0.11	PG/G WET U	0.13	9.60	0.0110	1/30/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	<0.13	PG/G WET U	0.13	4.75	0.0000	1/30/2002	1.000	
72918-21-9	1,2,3,7,8-HxCDF	<0.16	PG/G WET U	0.16	8.55	0.0000	1/30/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	<0.15	PG/G WET U	0.15	9.50	0.0000	1/30/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.15	PG/G WET U	0.21	10.14	0.0015	1/30/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.25	PG/G WET U	0.25	7.92	0.0000	1/30/2002	1.000	
39001-02-0	OCDF	0.14	PG/G WET U	0.45	112.72	0.0001	1/30/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	86	PCT_REC				1/30/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	94	PCT_REC				1/30/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	91	PCT_REC				1/30/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	102	PCT_REC				1/30/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	103	PCT_REC				1/30/2002	1.000	
114423-97-1	13C-OCDD	93	PCT_REC				1/30/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	88	PCT_REC F				2/1/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	86	PCT_REC				1/30/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	91	PCT_REC				1/30/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	97	PCT_REC				1/30/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	97	PCT_REC				1/30/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	100	PCT_REC				1/30/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	95	PCT_REC				1/30/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	106	PCT_REC				1/30/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	106	PCT_REC				1/30/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	74	PCT_REC				1/30/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	DUPLICATE
SAMPLE_NO	ZS22
Composite Site	69A
Tissue Type	Fillet
FRACTION	T
SAMPLE_SIZE	5.0282
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-04
LAB_ID	49037-38-02

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	0.12	PG/G WET	U	0.24	1.07	0.1200	1/30/2002	1.000
40321-76-4	1,2,3,7,8-PeCDD	<0.20	PG/G WET	U	0.20	12.33	0.0000	1/30/2002	1.000
39227-28-6	1,2,3,4,7,8-HxCDD	<0.13	PG/G WET	U	0.13	12.01	0.0000	1/30/2002	1.000
57653-85-7	1,2,3,6,7,8-HxCDD	<0.14	PG/G WET	U	0.14	17.39	0.0000	1/30/2002	1.000
19408-74-3	1,2,3,7,8-HxCDD	0.06	PG/G WET	U	0.13	7.91	0.0060	1/30/2002	1.000
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.29	PG/G WET	J	0.24	6.01	0.0029	1/30/2002	1.000
3268-87-9	OCDD	0.91	PG/G WET	J	0.20	12.33	0.0009	1/30/2002	1.000
51207-31-9	2,3,7,8-TCDF	1.23	PG/G WET	F	0.22	1.20	0.0123	2/1/2002	1.000
57117-41-6	1,2,3,7,8-PeCDF	0.21	PG/G WET	U	0.32	9.80	0.0105	1/30/2002	1.000
57117-31-4	2,3,4,7,8-PeCDF	0.18	PG/G WET	U	0.31	6.96	0.0900	1/30/2002	1.000
70648-26-9	1,2,3,4,7,8-HxCDF	0.22	PG/G WET	J	0.08	9.49	0.0220	1/30/2002	1.000
57117-44-9	1,2,3,6,7,8-HxCDF	0.09	PG/G WET	J	0.08	4.74	0.0090	1/30/2002	1.000
72918-21-9	1,2,3,7,8,9-HxCDF	<0.10	PG/G WET	U	0.10	8.54	0.0000	1/30/2002	1.000
60851-34-5	2,3,4,6,7,8-HxCDF	<0.09	PG/G WET	U	0.09	9.49	0.0000	1/30/2002	1.000
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.24	PG/G WET	J	0.20	10.12	0.0091	1/30/2002	1.000
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.23	PG/G WET	U	0.23	7.91	0.0000	1/30/2002	1.000
39001-02-0	OCDF	0.29	PG/G WET	J	0.28	112.58	0.0003	1/30/2002	1.000
76523-40-5	13C-2,3,7,8-TCDD	86	PCT_REC					1/30/2002	1.000
109719-79-1	13C-1,2,3,7,8-PeCDD	94	PCT_REC					1/30/2002	1.000
109719-80-4	13C-1,2,3,4,7,8-HxCDD	89	PCT_REC					1/30/2002	1.000
109719-81-5	13C-1,2,3,6,7,8-HxCDD	97	PCT_REC					1/30/2002	1.000
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	98	PCT_REC					1/30/2002	1.000
114423-97-1	13C-OCDD	83	PCT_REC					1/30/2002	1.000
89059-46-1	13C-2,3,7,8-TCDF	92	PCT_REC F					2/1/2002	1.000
109719-77-9	13C-1,2,3,7,8-PeCDF	89	PCT_REC					1/30/2002	1.000
116843-02-8	13C-2,3,4,7,8-PeCDF	91	PCT_REC					1/30/2002	1.000
114423-98-2	13C-1,2,3,4,7,8-HxCDF	91	PCT_REC					1/30/2002	1.000
116843-03-9	13C-1,2,3,6,7,8-HxCDF	88	PCT_REC					1/30/2002	1.000
116843-04-0	13C-1,2,3,7,8,9-HxCDF	97	PCT_REC					1/30/2002	1.000
116843-05-1	13C-2,3,4,6,7,8-HxCDF	91	PCT_REC					1/30/2002	1.000
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	97	PCT_REC					1/30/2002	1.000
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	100	PCT_REC					1/30/2002	1.000
85508-50-5	37Cl-2,3,7,8-TCDD	81	PCT_REC					1/30/2002	1.000

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL							
	SAMPLE_NO	ZS27							
	Composite Site	NT18							
	Tissue Type	Fillet							
	FRACTION	T							
	SAMPLE_SIZE	4.0988							
	SAMPLE_SIZE_UNITS	G WET							
	PCT_LIPID								
	SAMPLE_DATE								
	EXTRACT_DATE	1/18/2002							
	LAB_EXTRACTION_ID	49170-19-05							
	LAB_ID	49037-38-04							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	0.26	PG/G WET J	0.18	1.32	0.2600	1/30/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	0.31	PG/G WET J	0.23	15.13	0.1550	1/30/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	<0.18	PG/G WET U	0.18	14.74	0.0000	1/30/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	<0.19	PG/G WET U	0.19	21.34	0.0000	1/30/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	<0.17	PG/G WET U	0.17	9.70	0.0000	1/30/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.26	PG/G WET J	0.21	7.37	0.0026	1/30/2002	1.000	
3268-87-9	OCDD	0.89	PG/G WET J	0.12	15.13	0.0009	1/30/2002	1.000	
51207-31-9	2,3,7,8-TCDF	1.26	PG/G WET JF	0.30	1.48	0.1260	2/1/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	0.53	PG/G WET J	0.26	12.03	0.0265	1/30/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	0.35	PG/G WET J	0.23	8.54	0.1750	1/30/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	0.29	PG/G WET J	0.12	11.64	0.0290	1/30/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	0.16	PG/G WET J	0.13	5.82	0.0160	1/30/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	0.07	PG/G WET U	0.14	10.48	0.0070	1/30/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	0.08	PG/G WET U	0.14	11.64	0.0080	1/30/2002	1.000	
67562-93-4	1,2,3,4,6,7,8-HpCDF	0.22	PG/G WET J	0.20	12.42	0.0022	1/30/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.25	PG/G WET U	0.25	9.70	0.0000	1/30/2002	1.000	
39001-02-0	OCDF	0.19	PG/G WET U	0.24	138.10	0.0002	1/30/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	94	PCT_REC					1/30/2002	1.000
109719-79-1	13C-1,2,3,7,8-PeCDD	107	PCT_REC					1/30/2002	1.000
109719-80-4	13C-1,2,3,4,7,8-HxCDD	98	PCT_REC					1/30/2002	1.000
109719-81-5	13C-1,2,3,6,7,8-HxCDD	110	PCT_REC					1/30/2002	1.000
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	107	PCT_REC					1/30/2002	1.000
114423-97-1	13C-OCDD	94	PCT_REC					1/30/2002	1.000
89059-46-1	13C-2,3,7,8-TCDF	96	PCT_REC F					2/1/2002	1.000
109719-77-9	13C-1,2,3,7,8-PeCDF	95	PCT_REC					1/30/2002	1.000
116843-02-8	13C-2,3,4,7,8-PeCDF	102	PCT_REC					1/30/2002	1.000
114423-98-2	13C-1,2,3,4,7,8-HxCDF	103	PCT_REC					1/30/2002	1.000
116843-03-9	13C-1,2,3,6,7,8-HxCDF	98	PCT_REC					1/30/2002	1.000
116843-04-0	13C-1,2,3,7,8,9-HxCDF	105	PCT_REC					1/30/2002	1.000
116843-05-1	13C-2,3,4,6,7,8-HxCDF	101	PCT_REC					1/30/2002	1.000
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	111	PCT_REC					1/30/2002	1.000
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	108	PCT_REC					1/30/2002	1.000
85508-50-5	37Cl-2,3,7,8-TCDD	84	PCT_REC					1/30/2002	1.000

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY ECO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	0.67	PG/G WET J	0.52	2.15	0.6700	1/31/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	0.80	PG/G WET J	0.54	24.66	0.4000	1/31/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	0.15	PG/G WET U	0.39	24.02	0.0150	1/31/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	1.60	PG/G WET J	0.39	34.78	0.1600	1/31/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	0.36	PG/G WET U	0.37	15.81	0.0360	1/31/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	1.17	PG/G WET J	0.49	12.01	0.0117	1/31/2002	1.000	
3268-87-9	OCDD	2.36	PG/G WET J	0.14	24.66	0.0024	1/31/2002	1.000	
51207-31-9	2,3,7,8-TCDF	32.61	PG/G WET F	0.73	2.41	3.2610	2/1/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	2.42	PG/G WET J	0.58	19.61	0.1210	1/31/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	1.89	PG/G WET J	0.48	13.92	0.9450	1/31/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	0.56	PG/G WET J	0.24	18.97	0.0560	1/31/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	0.48	PG/G WET J	0.23	9.49	0.0480	1/31/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	<0.29	PG/G WET U	0.29	17.08	0.0000	1/31/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	0.45	PG/G WET J	0.27	18.97	0.0450	1/31/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.50	PG/G WET J	0.31	20.24	0.0050	1/31/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.08	PG/G WET U	0.38	15.81	0.0008	1/31/2002	1.000	
39001-02-0	OCDF	0.14	PG/G WET U	0.48	225.12	0.0001	1/31/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	76	PCT_REC					1/31/2002	1.000
109719-79-1	13C-1,2,3,7,8-PeCDD	87	PCT_REC					1/31/2002	1.000
109719-80-4	13C-1,2,3,4,7,8-HxCDD	87	PCT_REC					1/31/2002	1.000
109719-81-5	13C-1,2,3,6,7,8-HxCDD	98	PCT_REC					1/31/2002	1.000
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	101	PCT_REC					1/31/2002	1.000
114423-97-1	13C-OCDD	107	PCT_REC					1/31/2002	1.000
89059-46-1	13C-2,3,7,8-TCDF	84	PCT_REC F					2/1/2002	1.000
109719-77-9	13C-1,2,3,7,8-PeCDF	78	PCT_REC					1/31/2002	1.000
116843-02-8	13C-2,3,4,7,8-PeCDF	92	PCT_REC					1/31/2002	1.000
114423-98-2	13C-1,2,3,4,7,8-HxCDF	90	PCT_REC					1/31/2002	1.000
116843-03-9	13C-1,2,3,6,7,8-HxCDF	93	PCT_REC					1/31/2002	1.000
116843-04-0	13C-1,2,3,7,8,9-HxCDF	93	PCT_REC					1/31/2002	1.000
116843-05-1	13C-2,3,4,6,7,8-HxCDF	90	PCT_REC					1/31/2002	1.000
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	103	PCT_REC					1/31/2002	1.000
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	104	PCT_REC					1/31/2002	1.000
85508-50-5	37Cl-2,3,7,8-TCDD	65	PCT_REC					1/31/2002	1.000

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	1.14	PG/G WET J	0.23	1.06	1.1390	2/19/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	1.18	PG/G WET J	0.24	12.21	0.5920	2/19/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	0.83	PG/G WET U	0.14	11.90	0.0080	2/19/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	2.23	PG/G WET J	0.15	17.23	0.2230	2/19/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	0.49	PG/G WET J	0.14	7.83	0.0490	2/19/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	1.97	PG/G WET J	0.22	5.95	0.0200	2/19/2002	1.000	
3268-87-9	OCDD	4.24	PG/G WET J	0.17	12.21	0.0040	2/19/2002	1.000	
51207-31-9	2,3,7,8-TCDF	44.78	PG/G WET F	0.68	1.19	4.4780	2/20/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	3.61	PG/G WET J	0.22	9.71	0.1800	2/19/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	2.62	PG/G WET J	0.16	6.89	1.3080	2/19/2002	1.000	
70649-26-9	1,2,3,4,7,8-HxCDF	0.42	PG/G WET J	0.08	9.40	0.0420	2/19/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	0.48	PG/G WET J	0.08	4.70	0.0480	2/19/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	<0.10	PG/G WET U	0.10	8.46	0.0000	2/19/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	0.49	PG/G WET J	0.09	9.40	0.0490	2/19/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.74	PG/G WET J	0.23	10.03	0.0070	2/19/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.27	PG/G WET U	0.27	7.83	0.0000	2/19/2002	1.000	
39001-02-0	OCDF	0.62	PG/G WET J	0.22	111.50	0.0010	2/19/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	56	PCT_REC				2/19/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	77	PCT_REC				2/19/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	67	PCT_REC				2/19/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	67	PCT_REC				2/19/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	72	PCT_REC				2/19/2002	1.000	
114423-97-1	13C-OCDD	77	PCT_REC				2/19/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	63	PCT_REC F				2/20/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	64	PCT_REC				2/19/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	89	PCT_REC				2/19/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	67	PCT_REC				2/19/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	65	PCT_REC				2/19/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	64	PCT_REC				2/19/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	67	PCT_REC				2/19/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	75	PCT_REC				2/19/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	77	PCT_REC				2/19/2002	1.000	
85508-50-5	37CH-2,3,7,8-TCDD	48	PCT_REC				2/19/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	DUPLICATE								
SAMPLE_NO	ZL09									
Composite Site	69BWF									
Tissue Type	Liver									
FRACTION	T									
SAMPLE_SIZE	2.5334									
SAMPLE_SIZE_UNITS	G WET									
PCT_LIPID										
SAMPLE_DATE										
EXTRACT_DATE	1/18/2002									
LAB_EXTRACTION_ID	49170-19-10									
LAB_ID	49037-38-05									
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR	
1746-01-6	2,3,7,8-TCDD	1.14	PG/G WET J	0.33	2.13	1.1400	1/31/2002	1.000		
40321-76-4	1,2,3,7,8-PeCDD	1.36	PG/G WET J	0.43	24.47	0.6800	1/31/2002	1.000		
39227-28-6	1,2,3,4,7,8-HxCDD	0.11	PG/G WET U	0.39	23.84	0.0110	1/31/2002	1.000		
57653-85-7	1,2,3,6,7,8-HxCDD	2.52	PG/G WET J	0.40	34.52	0.2520	1/31/2002	1.000		
19408-74-3	1,2,3,7,8,9-HxCDD	0.60	PG/G WET J	0.38	15.69	0.0600	1/31/2002	1.000		
35822-46-9	1,2,3,4,6,7,8-HpCDD	1.89	PG/G WET J	0.71	11.92	0.0189	1/31/2002	1.000		
3268-87-9	OCDD	2.79	PG/G WET J	0.46	24.47	0.0028	1/31/2002	1.000		
51207-31-9	2,3,7,8-TCDF	46.04	PG/G WET F	1.10	2.39	4.6040	2/1/2002	1.000		
57117-41-6	1,2,3,7,8-PeCDF	4.39	PG/G WET J	0.58	19.46	0.2195	1/31/2002	1.000		
57117-31-4	2,3,4,7,8-PeCDF	2.83	PG/G WET J	0.43	13.82	1.4150	1/31/2002	1.000		
70648-26-9	1,2,3,4,7,8-HxCDF	0.62	PG/G WET J	0.19	18.83	0.0620	1/31/2002	1.000		
57117-44-9	1,2,3,6,7,8-HxCDF	0.63	PG/G WET J	0.19	9.41	0.0630	1/31/2002	1.000		
72918-21-9	1,2,3,7,8,9-HxCDF	<0.21	PG/G WET U	0.21	16.95	0.0000	1/31/2002	1.000		
60851-34-5	2,3,4,6,7,8-HxCDF	0.46	PG/G WET J	0.20	18.83	0.0460	1/31/2002	1.000		
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.56	PG/G WET J	0.32	20.09	0.0560	1/31/2002	1.000		
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.05	PG/G WET J	0.37	15.69	0.0005	1/31/2002	1.000		
39001-02-0	OCDF	0.32	PG/G WET J	0.71	223.43	0.0003	1/31/2002	1.000		
76523-40-5	13C-2,3,7,8-TCDD	55	PCT_REC				1/31/2002	1.000		
109719-79-1	13C-1,2,3,7,8-PeCDD	67	PCT_REC				1/31/2002	1.000		
109719-80-4	13C-1,2,3,4,7,8-HxCDD	60	PCT_REC				1/31/2002	1.000		
109719-81-5	13C-1,2,3,6,7,8-HxCDD	63	PCT_REC				1/31/2002	1.000		
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	71	PCT_REC				1/31/2002	1.000		
114423-97-1	13C-OCDD	76	PCT_REC				1/31/2002	1.000		
89059-46-1	13C-2,3,7,8-TCDF	62	PCT_REC F				2/1/2002	1.000		
109719-77-9	13C-1,2,3,7,8-PeCDF	51	PCT_REC				1/31/2002	1.000		
116843-02-8	13C-2,3,4,7,8-PeCDF	67	PCT_REC				1/31/2002	1.000		
114423-98-2	13C-1,2,3,4,7,8-HxCDF	61	PCT_REC				1/31/2002	1.000		
116843-03-9	13C-1,2,3,6,7,8-HxCDF	59	PCT_REC				1/31/2002	1.000		
116843-04-0	13C-1,2,3,7,8,9-HxCDF	64	PCT_REC				1/31/2002	1.000		
116843-05-1	13C-2,3,4,6,7,8-HxCDF	60	PCT_REC				1/31/2002	1.000		
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	72	PCT_REC				1/31/2002	1.000		
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	73	PCT_REC				1/31/2002	1.000		
85508-50-5	37Cl-2,3,7,8-TCDD	46	PCT_REC				1/31/2002	1.000		

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRLQ
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	NORMAL	SAMPLE_NO	ZL11	Composite Site	16,18 North Tow - WF	Tissue Type	Liver	FRACTION	T	SAMPLE_SIZE	2.0131	SAMPLE_SIZE_UNITS	G WET	PCT_LIPID	SAMPLE_DATE	EXTRACT_DATE	1/18/2002	LAB_EXTRACTION_ID	49170-19-11	LAB_ID	49037-38-07
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR													
1746-01-6	2,3,7,8-TCDD	1.03	PG/G WET J	0.30	2.68	1.0300	1/31/2002	1.000														
40321-76-4	1,2,3,7,8-PeCDD	1.09	PG/G WET J	0.37	30.80	0.5450	1/31/2002	1.000														
39227-28-6	1,2,3,4,7,8-HxCDD	<0.02	PG/G WET U	0.02	30.00	0.0000	1/31/2002	1.000														
57653-85-7	1,2,3,6,7,8-HxCDD	1.51	PG/G WET J	0.02	43.44	0.1510	1/31/2002	1.000														
19408-74-3	1,2,3,7,8,9-HxCDD	0.25	PG/G WET J	0.02	19.75	0.0250	1/31/2002	1.000														
35822-46-9	1,2,3,4,6,7,8-HpCDD	1.43	PG/G WET J	0.41	15.00	0.0143	1/31/2002	1.000														
3268-87-9	OCDD	2.77	PG/G WET J	0.42	30.80	0.0028	1/31/2002	1.000														
51207-31-9	2,3,7,8-TCDF	38.06	PG/G WET F	0.81	3.01	3.8060	2/1/2002	1.000														
57117-41-6	1,2,3,7,8-PeCDF	3.71	PG/G WET J	0.55	24.49	0.1855	1/31/2002	1.000														
57117-31-4	2,3,4,7,8-PeCDF	2.07	PG/G WET J	0.40	17.39	1.0350	1/31/2002	1.000														
70648-26-9	1,2,3,4,7,8-HxCDF	0.46	PG/G WET J	0.01	23.69	0.0460	1/31/2002	1.000														
57117-44-9	1,2,3,6,7,8-HxCDF	0.41	PG/G WET J	0.01	11.85	0.0410	1/31/2002	1.000														
72918-21-9	1,2,3,7,8,9-HxCDF	<0.02	PG/G WET U	0.02	21.34	0.0000	1/31/2002	1.000														
60851-34-5	2,3,4,6,7,8-HxCDF	0.42	PG/G WET J	0.02	23.69	0.0410	1/31/2002	1.000														
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.36	PG/G WET U	0.48	25.28	0.0036	1/31/2002	1.000														
55673-89-7	1,2,3,4,7,8,9-HpCDF	<0.52	PG/G WET U	0.52	19.75	0.0000	1/31/2002	1.000														
39001-02-0	OCDF	0.32	PG/G WET U	0.64	281.18	0.0003	1/31/2002	1.000														
76523-40-5	13C-2,3,7,8-TCDD	88	PCT_REC				1/31/2002	1.000														
109719-79-1	13C-1,2,3,7,8-PeCDD	121	PCT_REC				1/31/2002	1.000														
109719-80-4	13C-1,2,3,4,7,8-HxCDD	92	PCT_REC				1/31/2002	1.000														
109719-81-5	13C-1,2,3,6,7,8-HxCDD	95	PCT_REC				1/31/2002	1.000														
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	100	PCT_REC				1/31/2002	1.000														
114423-97-1	13C-OCDD	112	PCT_REC				1/31/2002	1.000														
89059-46-1	13C-2,3,7,8-TCDF	93	PCT_REC F				2/1/2002	1.000														
109719-77-9	13C-1,2,3,7,8-PeCDF	90	PCT_REC				1/31/2002	1.000														
116843-02-8	13C-2,3,4,7,8-PeCDF	124	PCT_REC				1/31/2002	1.000														
114423-98-2	13C-1,2,3,4,7,8-HxCDF	89	PCT_REC				1/31/2002	1.000														
116843-03-9	13C-1,2,3,6,7,8-HxCDF	83	PCT_REC				1/31/2002	1.000														
116843-04-0	13C-1,2,3,7,8,9-HxCDF	93	PCT_REC				1/31/2002	1.000														
116843-05-1	13C-2,3,4,6,7,8-HxCDF	92	PCT_REC				1/31/2002	1.000														
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	103	PCT_REC				1/31/2002	1.000														
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	109	PCT_REC				1/31/2002	1.000														
85508-50-5	37Cl-2,3,7,8-TCDD	73	PCT_REC				1/31/2002	1.000														

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

Quality Control Data

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	M_BLANK							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	<2.74	PG/G WET U	2.74	9.02	0.0000	1/30/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	<2.98	PG/G WET U	2.98	103.61	0.0000	1/30/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	<2.61	PG/G WET U	2.61	100.94	0.0000	1/30/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	<2.63	PG/G WET U	2.63	146.14	0.0000	1/30/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	<2.46	PG/G WET U	2.46	66.43	0.0000	1/30/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	0.74	PG/G WET U	2.12	50.47	0.0074	1/30/2002	1.000	
3268-87-9	OCDD	6.85	PG/G WET J	2.56	103.61	0.0069	1/30/2002	1.000	
51207-31-9	2,3,7,8-TCDF	<2.57	PG/G WET UF	2.57	10.11	0.0000	2/1/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	<2.80	PG/G WET U	2.80	82.39	0.0000	1/30/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	<2.81	PG/G WET U	2.81	58.49	0.0000	1/30/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	0.94	PG/G WET U	1.30	79.71	0.0940	1/30/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	<1.32	PG/G WET U	1.32	39.86	0.0000	1/30/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	<1.73	PG/G WET U	1.73	71.77	0.0000	1/30/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	<1.45	PG/G WET U	1.45	79.71	0.0000	1/30/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	<1.69	PG/G WET U	1.69	85.06	0.0000	1/30/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	<2.58	PG/G WET U	2.58	66.43	0.0000	1/30/2002	1.000	
39001-02-0	OCDF	<3.42	PG/G WET U	3.42	945.94	0.0000	1/30/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	57	PCT_REC				1/30/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	66	PCT_REC				1/30/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	65	PCT_REC				1/30/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	75	PCT_REC				1/30/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	76	PCT_REC				1/30/2002	1.000	
114423-97-1	13C-OCDD	62	PCT_REC				1/30/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	64	PCT_REC F				2/1/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	60	PCT_REC				1/30/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	59	PCT_REC				1/30/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	71	PCT_REC				1/30/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	70	PCT_REC				1/30/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	66	PCT_REC				1/30/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	71	PCT_REC				1/30/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	83	PCT_REC				1/30/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	63	PCT_REC				1/30/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	51	PCT_REC				1/30/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE LCS
 SAMPLE_NO
 Composite Site
 Tissue Type
 FRACTION T
 SAMPLE_SIZE 0.5869
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-15
 LAB_ID 48401-44-03

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	Method 1613B					
					Limits (ng/ml)	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	9.71	NG/ML WET	6.7 - 15.8	0.09	9.20	330.95	1/30/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	50.28	NG/ML WET	35 - 71	0.12	105.64	856.85	1/30/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	48.98	NG/ML WET	35 - 82	0.08	102.91	166.94	1/30/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	53.45	NG/ML WET	38 - 67	0.08	149.00	182.17	1/30/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	50.47	NG/ML WET	32 - 81	0.08	67.73	172.02	1/30/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	48.94	NG/ML WET	35 - 70	0.09	51.46	16.680	1/30/2002	1.000	
3268-87-9	OCDD	105.07	NG/ML WET	78 - 144	0.05	105.64	3.5811	1/30/2002	1.000	
51207-31-9	2,3,7,8-TCDF	10.16	NG/ML WET	7.5 - 15.8	0.08	10.31	34.628	1/30/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	51.07	NG/ML WET	40 - 67	0.08	84.00	87.031	1/30/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	50.31	NG/ML WET	34 - 80	0.08	59.64	857.36	1/30/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	48.89	NG/ML WET	36 - 67	0.06	81.27	166.63	1/30/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	48.42	NG/ML WET	42 - 65	0.05	40.64	165.03	1/30/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	46.46	NG/ML WET	39 - 65	0.07	73.18	158.35	1/30/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	49.6	NG/ML WET	35 - 78	0.06	81.27	169.05	1/30/2002	1.000	
67562-39-4	1,2,3,4,6,7,8-HpCDF	48.9	NG/ML WET	41 - 61	0.33	86.73	16.667	1/30/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	50.51	NG/ML WET	39 - 69	0.44	67.73	17.215	1/30/2002	1.000	
39001-02-0	OCDF	111.47	NG/ML WET	63 - 170	0.11	964.47	3.799	1/30/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	30.21	NG/ML WET	20 - 175				1/30/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	65.68	NG/ML WET	21 - 227				1/30/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	64.81	NG/ML WET	21 - 193				1/30/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	73.44	NG/ML WET	25 - 163				1/30/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	73.94	NG/ML WET	26 - 166				1/30/2002	1.000	
114423-97-1	13C-OCDD	135.35	NG/ML WET	26 - 397				1/30/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	59.12	NG/ML WET	22 - 152				1/30/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	60.46	NG/ML WET	21 - 192				1/30/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	58.71	NG/ML WET	13 - 328				1/30/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	69.65	NG/ML WET	19 - 202				1/30/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	69.14	NG/ML WET	21 - 159				1/30/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	69.03	NG/ML WET	17 - 205				1/30/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	69.13	NG/ML WET	22 - 176				1/30/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	80.92	NG/ML WET	21 - 158				1/30/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	74.82	NG/ML WET	20 - 186				1/30/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	2.67	NG/ML WET	NA				1/30/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE MS
 SAMPLE_NO ZS27
 Composite Site NT18
 Tissue Type Fillet
 FRACTION T
 SAMPLE_SIZE 3.9750
 SAMPLE_SIZE_UNITS G WET
 PCT_UPID
 SAMPLE_DATE 1/18/2002
 EXTRACT_DATE 49170-19-06
 LAB_EXTRACTION_ID 49037-38-04
 LAB_ID

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	91	PCT_REC	0.20	1.36	46.020	1/31/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	94	PCT_REC	0.24	15.60	117.79	1/31/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	92	PCT_REC	0.24	15.19	23.092	1/31/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	97	PCT_REC	0.24	22.00	24.467	1/31/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	91	PCT_REC	0.22	10.00	22.827	1/31/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	93	PCT_REC	0.26	7.60	2.3331	1/31/2002	1.000	
3268-87-9	OCDD	96	PCT_REC	0.09	15.60	0.4844	1/31/2002	1.000	
51207-31-9	2,3,7,8-TCDF	88	PCT_REC	0.14	1.52	4.5430	1/31/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	94	PCT_REC	0.29	12.40	11.884	1/31/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	90	PCT_REC	0.24	8.81	113.91	1/31/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	93	PCT_REC	0.18	12.00	23.374	1/31/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	94	PCT_REC	0.18	6.00	23.594	1/31/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	89	PCT_REC	0.22	10.81	22.363	1/31/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	93	PCT_REC	0.20	12.00	23.356	1/31/2002	1.000	
67862-59-4	1,2,3,4,6,7,8-HpCDF	90	PCT_REC	0.61	12.81	2.2671	1/31/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	93	PCT_REC	0.73	10.00	2.3407	1/31/2002	1.000	
39001-02-0	OCDF	95	PCT_REC	0.21	142.40	0.4805	1/31/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	87	PCT_REC				1/31/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	104	PCT_REC				1/31/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	101	PCT_REC				1/31/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	107	PCT_REC				1/31/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	106	PCT_REC				1/31/2002	1.000	
114423-97-1	13C-OCDD	105	PCT_REC				1/31/2002	1.000	
89059-48-1	13C-2,3,7,8-TCDF	93	PCT_REC				1/31/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	90	PCT_REC				1/31/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	110	PCT_REC				1/31/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	104	PCT_REC				1/31/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	100	PCT_REC				1/31/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	107	PCT_REC				1/31/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	104	PCT_REC				1/31/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	109	PCT_REC				1/31/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	111	PCT_REC				1/31/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	73	PCT_REC				1/31/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	MS							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	94	PCT_REC	0.30	2.67	94.170	1/31/2002	1.000	
40321-76-4	1,2,3,7,8-PeCDD	100	PCT_REC	0.39	30.60	246.35	1/31/2002	1.000	
39227-28-6	1,2,3,4,7,8-HxCDD	98	PCT_REC	0.20	29.81	48.430	1/31/2002	1.000	
57653-85-7	1,2,3,6,7,8-HxCDD	104	PCT_REC	0.21	43.17	51.561	1/31/2002	1.000	
19408-74-3	1,2,3,7,8,9-HxCDD	91	PCT_REC	0.19	19.62	44.830	1/31/2002	1.000	
35822-46-9	1,2,3,4,6,7,8-HpCDD	97	PCT_REC	0.65	14.91	4.8095	1/31/2002	1.000	
3268-87-9	OCDD	103	PCT_REC	0.04	30.60	1.0166	1/31/2002	1.000	
51207-31-9	2,3,7,8-TCDF	92	PCT_REC	0.35	2.99	12.906	1/31/2002	1.000	
57117-41-6	1,2,3,7,8-PeCDF	100	PCT_REC	0.37	24.33	24.809	1/31/2002	1.000	
57117-31-4	2,3,4,7,8-PeCDF	99	PCT_REC	0.27	17.28	244.68	1/31/2002	1.000	
70648-26-9	1,2,3,4,7,8-HxCDF	100	PCT_REC	0.34	23.55	49.243	1/31/2002	1.000	
57117-44-9	1,2,3,6,7,8-HxCDF	98	PCT_REC	0.35	11.77	48.595	1/31/2002	1.000	
72918-21-9	1,2,3,7,8,9-HxCDF	95	PCT_REC	0.43	21.20	47.007	1/31/2002	1.000	
60851-34-5	2,3,4,6,7,8-HxCDF	101	PCT_REC	0.38	23.55	49.939	1/31/2002	1.000	
67582-39-4	1,2,3,4,6,7,8-HpCDF	97	PCT_REC	0.87	25.12	4.7704	1/31/2002	1.000	
55673-89-7	1,2,3,4,7,8,9-HpCDF	99	PCT_REC	1.05	19.62	4.8774	1/31/2002	1.000	
39001-02-0	OCDF	100	PCT_REC	0.32	279.41	0.9919	1/31/2002	1.000	
76523-40-5	13C-2,3,7,8-TCDD	93	PCT_REC				1/31/2002	1.000	
109719-79-1	13C-1,2,3,7,8-PeCDD	107	PCT_REC				1/31/2002	1.000	
109719-80-4	13C-1,2,3,4,7,8-HxCDD	116	PCT_REC				1/31/2002	1.000	
109719-81-5	13C-1,2,3,6,7,8-HxCDD	121	PCT_REC				1/31/2002	1.000	
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	122	PCT_REC				1/31/2002	1.000	
114423-97-1	13C-OCDD	128	PCT_REC				1/31/2002	1.000	
89059-46-1	13C-2,3,7,8-TCDF	92	PCT_REC				1/31/2002	1.000	
109719-77-9	13C-1,2,3,7,8-PeCDF	94	PCT_REC				1/31/2002	1.000	
116843-02-8	13C-2,3,4,7,8-PeCDF	122	PCT_REC				1/31/2002	1.000	
114423-98-2	13C-1,2,3,4,7,8-HxCDF	118	PCT_REC				1/31/2002	1.000	
116843-03-9	13C-1,2,3,6,7,8-HxCDF	113	PCT_REC				1/31/2002	1.000	
116843-04-0	13C-1,2,3,7,8,9-HxCDF	118	PCT_REC				1/31/2002	1.000	
116843-05-1	13C-2,3,4,6,7,8-HxCDF	117	PCT_REC				1/31/2002	1.000	
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	127	PCT_REC				1/31/2002	1.000	
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	128	PCT_REC				1/31/2002	1.000	
85508-50-5	37Cl-2,3,7,8-TCDD	83	PCT_REC				1/31/2002	1.000	

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

PROJECT_NAME USACE/NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1613B
 CLASS DIOXI
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

	QC_TYPE	SRM							
CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EDL	QL	TEQ	ANAL_DATE	DIL_FACTOR
1746-01-6	2,3,7,8-TCDD	28.7	PCT_DIFF		0.11	1.13	13.550	1/31/2002	1.000
40321-76-4	1,2,3,7,8-PeCDD	30.7	PCT_DIFF N		0.16	12.99	13.870	1/31/2002	1.000
39227-28-6	1,2,3,4,7,8-HxCDD	36.1	PCT_DIFF N		0.06	12.65	3.8360	1/31/2002	1.000
57653-85-7	1,2,3,6,7,8-HxCDD	32.8	PCT_DIFF N		0.06	18.32	3.7610	1/31/2002	1.000
19408-74-3	1,2,3,7,8,9-HxCDD	39.5	PCT_DIFF N		0.06	8.33	3.6320	1/31/2002	1.000
35822-46-9	1,2,3,4,6,7,8-HpCDD	29.1	PCT_DIFF		0.23	6.33	0.5385	1/31/2002	1.000
3268-87-9	OCDD	26.0	PCT_DIFF		0.06	12.99	0.1421	1/31/2002	1.000
51207-31-9	2,3,7,8-TCDF	17.1	PCT_DIFF		0.11	1.27	1.4100	1/31/2002	1.000
57117-41-6	1,2,3,7,8-PeCDF	24.5	PCT_DIFF		0.16	10.33	1.5100	1/31/2002	1.000
57117-31-4	2,3,4,7,8-PeCDF	27.9	PCT_DIFF		0.11	7.33	13.690	1/31/2002	1.000
70648-26-9	1,2,3,4,7,8-HxCDF	24.8	PCT_DIFF		0.04	9.99	6.0190	1/31/2002	1.000
57117-44-9	1,2,3,6,7,8-HxCDF	27.7	PCT_DIFF		0.04	5.00	4.5560	1/31/2002	1.000
72918-21-9	1,2,3,7,8,9-HxCDF	31.4	PCT_DIFF N		0.04	9.00	3.9760	1/31/2002	1.000
60851-34-5	2,3,4,6,7,8-HxCDF	25.7	PCT_DIFF		0.04	9.99	4.4610	1/31/2002	1.000
67562-39-4	1,2,3,4,6,7,8-HpCDF	29.3	PCT_DIFF		1.17	10.66	0.5872	1/31/2002	1.000
55673-89-7	1,2,3,4,7,8,9-HpCDF	23.1	PCT_DIFF		1.29	8.33	0.5616	1/31/2002	1.000
39001-02-0	OCDF	23.4	PCT_DIFF		0.13	118.56	0.1455	1/31/2002	1.000
76523-40-5	13C-2,3,7,8-TCDD	111	PCT_REC					1/31/2002	1.000
109719-79-1	13C-1,2,3,7,8-PeCDD	153	PCT_REC N					1/31/2002	1.000
109719-80-4	13C-1,2,3,4,7,8-HxCDD	123	PCT_REC					1/31/2002	1.000
109719-81-5	13C-1,2,3,6,7,8-HxCDD	132	PCT_REC					1/31/2002	1.000
109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	141	PCT_REC					1/31/2002	1.000
114423-97-1	13C-OCDD	141	PCT_REC					1/31/2002	1.000
89059-46-1	13C-2,3,7,8-TCDF	108	PCT_REC					1/31/2002	1.000
109719-77-9	13C-1,2,3,7,8-PeCDF	113	PCT_REC					1/31/2002	1.000
116843-02-8	13C-2,3,4,7,8-PeCDF	164	PCT_REC N					1/31/2002	1.000
114423-98-2	13C-1,2,3,4,7,8-HxCDF	128	PCT_REC					1/31/2002	1.000
116843-03-9	13C-1,2,3,6,7,8-HxCDF	124	PCT_REC					1/31/2002	1.000
116843-04-0	13C-1,2,3,7,8,9-HxCDF	131	PCT_REC					1/31/2002	1.000
116843-05-1	13C-2,3,4,6,7,8-HxCDF	129	PCT_REC					1/31/2002	1.000
116843-09-5	13C-1,2,3,4,6,7,8-HpCDF	137	PCT_REC					1/31/2002	1.000
109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	147	PCT_REC					1/31/2002	1.000
85508-50-5	37Cl-2,3,7,8-TCDD	89	PCT_REC					1/31/2002	1.000

U = Not detected; RL reported

F = Results from second column confirmation

J = Detected but below the detection limit

Battelle
USACE-NED Rhode Island Sound
Tissue Dioxin/Furan Data - SDG 49170-19

pg/g wet weight

ZL11(Site 16,18 North Tower WF, liver) MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

ANALYTE	Spike Conc. (pg/g wet)	49170-19-11 Background Conc. (pg/g wet)	49170-19-12 MS Conc. Found (pg/g wet)	Recovery (%)	MSD Spike Conc. (pg/g wet)	49170-19-11 Background Conc. (pg/g wet)	MSD Dup. Conc. Found (pg/g wet)	Recovery (%)	RPD (%)
2378-TCDD	98.72	1.03	94.17	94	110.94	1.03	108.22	92	2
12378-PeCDD	493.61	1.09	492.70	100	554.72	1.08	544.16	98	2
123478-HxCDD	493.61	0.00	484.30	98	554.72	0.00	553.93	100	2
123678-HxCDD	493.61	1.51	515.61	104	554.72	1.51	564.36	101	3
123789-HxCDD	493.61	0.25	448.30	91	554.72	0.25	553.84	96	6
1234678-HpCDD	493.61	1.43	480.95	97	554.72	1.43	541.85	97	0
OCDD	987.22	2.77	1016.62	103	1109.45	2.77	1134.78	102	1
2378-TCDF	98.72	38.21	129.06	92	110.94	38.21	139.49	91	1
12378-PeCDF	493.61	3.71	496.17	100	554.72	3.71	542.89	97	3
23478-PeCDF	493.61	2.07	489.75	99	554.72	2.07	525.89	94	5
123478-HxCDF	493.61	0.46	492.43	100	554.72	0.46	564.11	102	2
123678-HxCDF	493.61	0.41	485.95	98	554.72	0.41	533.41	96	2
123789-HxCDF	493.61	0.00	470.07	95	554.72	0.00	526.45	95	0
234678-HxCDF	493.61	0.42	499.39	101	554.72	0.42	560.92	101	0
1234678-HpCDF	493.61	0.36	477.04	97	554.72	0.36	529.42	95	1
1234789-HpCDF	493.61	0.00	487.74	99	554.72	0.00	538.97	97	2
OCDF	987.22	0.32	991.87	100	1109.45	0.32	1101.06	99	1

%Recovery is calculated as ((conc. found-background conc.)/spike conc.)*100.

Battelle
 USACE-NED Rhode Island Sound
 Tissue Dioxin/Furan Data - SDG 49170-19
 pg/g wet weight

DUPLICATE RESULTS (pg/g wet):ZS22(69A, Fillet)

ANALYTE	49170-19-03	49170-19-04	Avg	STD	%RPD
2378-TCDD	0.07	0.12	NA	NA	NA
12378-PeCDD	ND	ND	NA	NA	NA
123478-HxCDD	ND	ND	NA	NA	NA
123678-HxCDD	ND	ND	NA	NA	NA
123789-HxCDD	ND	0.06	NA	NA	NA
1234678-HpCDD	ND	0.29	NA	NA	NA
OCDD	0.78	0.91	NA	NA	NA
2378-TCDF F	1.16	1.23	NA	NA	NA
12378-PeCDF	ND	0.21	NA	NA	NA
23478-PeCDF	ND	0.18	NA	NA	NA
123478-HxCDF	0.11	0.22	NA	NA	NA
123678-HxCDF	ND	0.09	NA	NA	NA
123789-HxCDF	ND	ND	NA	NA	NA
234678-HxCDF	ND	ND	NA	NA	NA
1234678-HpCDF	0.15	0.24	NA	NA	NA
1234789-HpCDF	ND	ND	NA	NA	NA
OCDF	0.14	0.29	NA	NA	NA

ND = not detected

NA = not applicable. Analyte not detected in both samples. Levels detected were below 10X the MDL.

Battelle
 USACE-NED Rhode Island Sound
 Tissue Dioxin/Furan Data - SDG 49170-19
 pg/g wet weight

DUPLICATE RESULTS (pg/g wet): ZL09(69BWF, liver)

ANALYTE	49170-44-02	49170-19-10	AVG	STD	%RPD
2378-TCDD	1.14	1.14	NA	NA	NA
12378-PeCDD	1.18	1.36	NA	NA	NA
123478-HxCDD	0.83	0.11	NA	NA	NA
123678-HxCDD	2.23	2.52	NA	NA	NA
123789-HxCDD	0.49	0.60	NA	NA	NA
1234678-HpCDD	1.97	1.89	NA	NA	NA
OCDD	4.24	2.79	NA	NA	NA
2378-TCDF F	44.78	46.04	45.41	0.89	2.8
12378-PeCDF	3.61	4.39	NA	NA	NA
23478-PeCDF	2.62	2.83	NA	NA	NA
123478-HxCDF	0.42	0.62	NA	NA	NA
123678-HxCDF	0.48	0.63	NA	NA	NA
123789-HxCDF	0.00	ND	NA	NA	NA
234678-HxCDF	0.49	0.46	NA	NA	NA
1234678-HpCDF	0.74	0.56	NA	NA	NA
1234789-HpCDF	0.00	0.05	NA	NA	NA
OCDF	0.62	0.32	NA	NA	NA

ND = not detected

NA = not applicable. Analyte not detected in both samples. Levels detected were below 10X the MDL.

Battelle
 USACE-NED Rhode Island Sound
 Tissue Dioxin/Furan Data - SDG 49170-19
 pg/g wet weight

STANDARD REFERENCE MATERIAL RESULTS
 Standard Matrix Reference Material 49170-19-14 (CIL EDF 2526)

ANALYTE	CONSENSUS VALUE (pg/g wet)	CONC. FOUND (pg/g wet)	% RECOVERY vs CONSENSUS	% DIFFERENCE vs CONSENSUS
2378-TCDD	19	13.55	71.3	28.7
12378-PeCDD	40	27.74	69.4	30.7
123478-HxCDD	60	38.36	63.9	36.1
123678-HxCDD	56	37.61	67.2	32.8
123789-HxCDD	60	36.32	60.5	39.5
1234678-HpCDD	76	53.85	70.9	29.1
OCDD	192	142.13	74.0	26.0
2378-TCDF	17	14.10	82.9	17.1
12378-PeCDF	40	30.20	75.5	24.5
23478-PeCDF	38	27.38	72.1	27.9
123478-HxCDF	80	60.19	75.2	24.8
123678-HxCDF	63	45.56	72.3	27.7
123789-HxCDF	58	39.76	68.6	31.4
234678-HxCDF	60	44.61	74.4	25.7
1234678-HpCDF	83	58.72	70.7	29.3
1234789-HpCDF	73	56.16	76.9	23.1
OCDF	190	145.45	76.6	23.4

N = outside QC range of 30%.