TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-81298-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Amy Dahl

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Authorized for release by:
11/26/2018 12:56:46 PM

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Job ID: 580-81298-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-81298-2

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Two samples were received on 10/24/2018 12:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9º C.

A sample container was provided to be archived frozen at the TestAmerica Sacramento laboratory pending potential additional analyses.

This report contains results for 1613B Dioxins / Furans performed at TestAmerica Sacramento.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DIOXIN/ FURAN

Samples PDI-SC-S154-4to6 (580-81298-1) and PDI-SC-S185-5to6.5 (580-81298-2) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 11/12/2018 and analyzed on 11/17/2018.

Several analytes were detected in method blank MB 320-258637/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SC-S154-4to6 (580-81298-1) and PDI-SC-S185-5to6.5 (580-81298-2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) HRMS-Sox: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SC-S154-4to6 (580-81298-1) and PDI-SC-S185-5to6.5 (580-81298-2). The reporting limits (RLs) have been adjusted proportionately.

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

Definitions/Glossary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

Qualifiers

Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

Glossary

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

Client Sample ID: PDI-SC-S154-4to6
Date Collected: 07/24/18 15:45
Date Received: 10/24/18 12:40

Lab Sample ID: 580-81298-1
Matrix: Solid
Percent Solids: 73.1

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	**0.0024**	**J B**	0.0035	0.000045	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,4,6,7,8-HpCDF	**0.000077**	**J B**	0.0035	0.000011	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,4,7,8,9-HpCDF	**0.000051**	**J q**	0.0035	0.000014	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,4,7,8-HxCDD	ND		0.0035	0.000034	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,4,7,8-HxCDF	ND		0.0035	0.000016	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,6,7,8-HxCDD	**0.00012**	**J q B**	0.0035	0.000032	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,6,7,8-HxCDF	ND		0.0035	0.000016	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,7,8,9-HxCDD	**0.00037**	**J**	0.0035	0.000031	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,7,8,9-HxCDF	**0.000059**	**J**	0.0035	0.0000093	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,7,8-PeCDD	**0.000054**	**J**	0.0035	0.000020	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
1,2,3,7,8-PeCDF	**0.000031**	**J q**	0.0035	0.000014	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
2,3,4,6,7,8-HxCDF	ND		0.0035	0.000013	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
2,3,4,7,8-PeCDF	**0.000029**	**J**	0.0035	0.000014	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
2,3,7,8-TCDD	ND		0.00069	0.000019	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
2,3,7,8-TCDF	**0.000042**	**J B**	0.00069	0.0000076	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
OCDD	**0.021**	**B**	0.0069	0.000025	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1
OCDF	**0.00013**	**J**	0.0069	0.000015	ug/Kg	☼	11/12/18 13:18	11/17/18 03:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*76*		*23 - 140*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*78*		*28 - 143*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*77*		*26 - 138*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,4,7,8-HxCDD	*71*		*32 - 141*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,4,7,8-HxCDF	*67*		*26 - 152*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,6,7,8-HxCDD	*70*		*28 - 130*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,6,7,8-HxCDF	*66*		*26 - 123*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,7,8,9-HxCDF	*79*		*29 - 147*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,7,8-PeCDD	*69*		*25 - 181*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-1,2,3,7,8-PeCDF	*67*		*24 - 185*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-2,3,4,7,8-PeCDF	*70*		*21 - 178*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-2,3,7,8-TCDD	*76*		*25 - 164*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-2,3,7,8-TCDF	*76*		*24 - 169*	*11/12/18 13:18*	*11/17/18 03:33*	*1*
13C-OCDD	*76*		*17 - 157*	*11/12/18 13:18*	*11/17/18 03:33*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*118*		*35 - 197*	*11/12/18 13:18*	*11/17/18 03:33*	*1*

Client Sample ID: PDI-SC-S185-5to6.5
Date Collected: 07/26/18 16:05
Date Received: 10/24/18 12:40

Lab Sample ID: 580-81298-2
Matrix: Solid
Percent Solids: 71.4

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	**0.0021**	**J B**	0.0035	0.000046	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,4,6,7,8-HpCDF	**0.00075**	**J B**	0.0035	0.000021	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,4,7,8,9-HpCDF	**0.00010**	**J**	0.0035	0.000025	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,4,7,8-HxCDD	ND		0.0035	0.000036	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,4,7,8-HxCDF	ND		0.0035	0.000054	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,6,7,8-HxCDD	**0.00014**	**J B**	0.0035	0.000035	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,6,7,8-HxCDF	ND		0.0035	0.000056	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,7,8,9-HxCDD	**0.00019**	**J**	0.0035	0.000033	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,7,8,9-HxCDF	**0.000072**	**J**	0.0035	0.000029	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,7,8-PeCDD	**0.000046**	**J q**	0.0035	0.000029	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
1,2,3,7,8-PeCDF	**0.000061**	**J q**	0.0035	0.000023	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
2,3,4,6,7,8-HxCDF	ND		0.0035	0.000041	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
2,3,4,7,8-PeCDF	**0.000070**	**J**	0.0035	0.000022	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
2,3,7,8-TCDD	**0.00017**	**J q**	0.00070	0.000030	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
2,3,7,8-TCDF	**0.00012**	**J B**	0.00070	0.000018	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
OCDD	**0.032**	**B**	0.0070	0.000055	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1
OCDF	**0.0012**	**J**	0.0070	0.000027	ug/Kg	☼	11/12/18 13:18	11/17/18 04:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*48*		*23 - 140*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*28 - 143*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*52*		*26 - 138*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,4,7,8-HxCDD	*51*		*32 - 141*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,4,7,8-HxCDF	*48*		*26 - 152*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,6,7,8-HxCDF	*46*		*26 - 123*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,7,8,9-HxCDF	*59*		*29 - 147*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,7,8-PeCDD	*52*		*25 - 181*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-1,2,3,7,8-PeCDF	*52*		*24 - 185*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-2,3,4,6,7,8-HxCDF	*49*		*28 - 136*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-2,3,4,7,8-PeCDF	*57*		*21 - 178*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*11/12/18 13:18*	*11/17/18 04:19*	*1*
13C-OCDD	*51*		*17 - 157*	*11/12/18 13:18*	*11/17/18 04:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*118*		*35 - 197*	*11/12/18 13:18*	*11/17/18 04:19*	*1*

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-258637/1-A
Matrix: Solid
Analysis Batch: 260207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 258637

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000182	J q	0.0050	0.000045	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,4,6,7,8-HpCDF	0.000136	J	0.0050	0.000029	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,4,7,8,9-HpCDF	ND		0.0050	0.000039	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,4,7,8-HxCDD	0.000165	J q	0.0050	0.000036	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000040	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,6,7,8-HxCDD	0.0000879	J q	0.0050	0.000037	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000038	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000031	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,7,8,9-HxCDF	ND		0.0050	0.000033	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000040	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000064	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000032	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000067	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
2,3,7,8-TCDD	ND		0.0010	0.000080	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
2,3,7,8-TCDF	0.000139	J	0.0010	0.000055	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
OCDD	0.00193	J q	0.010	0.000049	ug/Kg		11/12/18 13:18	11/20/18 16:32	1
OCDF	ND		0.010	0.000050	ug/Kg		11/12/18 13:18	11/20/18 16:32	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*84*		*23 - 140*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*84*		*28 - 143*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*85*		*26 - 138*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,4,7,8-HxCDD	*93*		*32 - 141*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,4,7,8-HxCDF	*91*		*26 - 152*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,6,7,8-HxCDD	*91*		*28 - 130*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,6,7,8-HxCDF	*92*		*26 - 123*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,7,8,9-HxCDF	*80*		*29 - 147*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,7,8-PeCDD	*73*		*25 - 181*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-1,2,3,7,8-PeCDF	*73*		*24 - 185*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-2,3,4,6,7,8-HxCDF	*87*		*28 - 136*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-2,3,4,7,8-PeCDF	*74*		*21 - 178*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-2,3,7,8-TCDD	*77*		*25 - 164*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-2,3,7,8-TCDF	*70*		*24 - 169*	*11/12/18 13:18*	*11/20/18 16:32*	*1*
13C-OCDD	*74*		*17 - 157*	*11/12/18 13:18*	*11/20/18 16:32*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*104*		*35 - 197*	*11/12/18 13:18*	*11/20/18 16:32*	*1*

Lab Sample ID: LCS 320-258637/2-A
Matrix: Solid
Analysis Batch: 260207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 258637

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.109		ug/Kg		109	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.110		ug/Kg		110	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.108		ug/Kg		108	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.107		ug/Kg		107	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.108		ug/Kg		108	72 - 134

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-258637/2-A
Matrix: Solid
Analysis Batch: 260207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 258637

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2,3,6,7,8-HxCDD			0.100	0.110		ug/Kg		110	76 - 134		
1,2,3,6,7,8-HxCDF			0.100	0.112		ug/Kg		112	84 - 130		
1,2,3,7,8,9-HxCDD			0.100	0.0981		ug/Kg		98	64 - 162		
1,2,3,7,8,9-HxCDF			0.100	0.112		ug/Kg		112	78 - 130		
1,2,3,7,8-PeCDD			0.100	0.110		ug/Kg		110	70 - 142		
1,2,3,7,8-PeCDF			0.100	0.107		ug/Kg		107	80 - 134		
2,3,4,6,7,8-HxCDF			0.100	0.113		ug/Kg		113	70 - 156		
2,3,4,7,8-PeCDF			0.100	0.104		ug/Kg		104	68 - 160		
2,3,7,8-TCDD			0.0200	0.0216		ug/Kg		108	67 - 158		
2,3,7,8-TCDF			0.0200	0.0222		ug/Kg		111	75 - 158		
OCDD			0.200	0.219		ug/Kg		109	78 - 144		
OCDF			0.200	0.226		ug/Kg		113	63 - 170		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*84*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*87*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*86*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*93*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*91*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*89*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*90*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*78*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*70*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*70*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*86*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*71*		*13 - 328*
13C-2,3,7,8-TCDD	*73*		*20 - 175*
13C-2,3,7,8-TCDF	*68*		*22 - 152*
13C-OCDD	*75*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*102*		*31 - 191*

Lab Sample ID: LCSD 320-258637/3-A
Matrix: Solid
Analysis Batch: 260207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 258637

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD			0.100	0.112		ug/Kg		112	70 - 140	3	50
1,2,3,4,6,7,8-HpCDF			0.100	0.111		ug/Kg		111	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF			0.100	0.111		ug/Kg		111	78 - 138	2	50
1,2,3,4,7,8-HxCDD			0.100	0.107		ug/Kg		107	70 - 164	0	50
1,2,3,4,7,8-HxCDF			0.100	0.110		ug/Kg		110	72 - 134	2	50
1,2,3,6,7,8-HxCDD			0.100	0.110		ug/Kg		110	76 - 134	1	50
1,2,3,6,7,8-HxCDF			0.100	0.113		ug/Kg		113	84 - 130	1	50
1,2,3,7,8,9-HxCDD			0.100	0.109		ug/Kg		109	64 - 162	10	50
1,2,3,7,8,9-HxCDF			0.100	0.113		ug/Kg		113	78 - 130	1	50
1,2,3,7,8-PeCDD			0.100	0.111		ug/Kg		111	70 - 142	1	50

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-258637/3-A
Matrix: Solid
Analysis Batch: 260207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 258637

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.107		ug/Kg		107	80 - 134	0	50
2,3,4,6,7,8-HxCDF			0.100	0.113		ug/Kg		113	70 - 156	0	50
2,3,4,7,8-PeCDF			0.100	0.106		ug/Kg		106	68 - 160	2	50
2,3,7,8-TCDD			0.0200	0.0218		ug/Kg		109	67 - 158	0	50
2,3,7,8-TCDF			0.0200	0.0222		ug/Kg		111	75 - 158	0	50
OCDD			0.200	0.221		ug/Kg		111	78 - 144	1	50
OCDF			0.200	0.230		ug/Kg		115	63 - 170	2	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*84*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*83*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*86*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*82*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*82*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*83*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*84*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*79*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*75*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*75*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*86*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*70*		*13 - 328*
13C-2,3,7,8-TCDD	*78*		*20 - 175*
13C-2,3,7,8-TCDF	*72*		*22 - 152*
13C-OCDD	*76*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*106*		*31 - 191*

Lab Chronicle

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

Client Sample ID: PDI-SC-S154-4to6

Lab Sample ID: 580-81298-1
Date Collected: 07/24/18 15:45
Matrix: Solid
Date Received: 10/24/18 12:40
Percent Solids: 73.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			258637	11/12/18 13:18	SR1	TAL SAC
Total/NA	Analysis	1613B		1	259786	11/17/18 03:33	AS	TAL SAC

Client Sample ID: PDI-SC-S185-5to6.5

Lab Sample ID: 580-81298-2
Date Collected: 07/26/18 16:05
Matrix: Solid
Date Received: 10/24/18 12:40
Percent Solids: 71.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			258637	11/12/18 13:18	SR1	TAL SAC
Total/NA	Analysis	1613B		1	259786	11/17/18 04:19	AS	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	11-30-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Sample Summary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-81298-1	PDI-SC-S154-4to6	Solid	07/24/18 15:45	10/24/18 12:40
580-81298-2	PDI-SC-S185-5to6.5	Solid	07/26/18 16:05	10/24/18 12:40

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Nicky Moody** **Laboratory Contact: Elaine-Walker**	**Date: 10/24/2018** **Carrier: Courier**	COC No: 1 1 of 1 pages
Client Contact AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Subsurface Sediment Sample Type:	**Analysis Turnaround Time** Calendar (C) or Work Days (W) _W_____ ☐ 21 days ☒ Other ASAP			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Grain size ASTM D7928/D6913	PCB Aroclors, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 160.3	Atterberg Limits ASTM D4318	Sample Specific Notes:
PDI-SC-S154 - 4 to 6	7/24/2018	15:45	SC		ED	3		x	x	x	x		Frozen 7/26/2018
PDI-SC-S185 - 5 to 6.5	7/26/2018	16:05	SC		ED	3		x	x	x	x		Frozen 7/26/2018
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column								AG	AG	WMG	WMG	AG	

580-81298 Chain of Custody

Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid

Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
☐ *Return To Client* ☒ *Disposal By Lab* ☒ *Archive For 12 Months*

Special Instructions/QC Requirements & Comments: **Separate reports for each lab**

4.9

Relinquished by: Nicky Moody	Company: AECOM	Date/Time: 10/24/18 @ 1145	Received by:	Company: M.E.	Date/Time: 10/24/18 11:45
Relinquished by:	Company:	Date/Time:	Received by:	Company: TAPOR	Date/Time: 10/24/18 1240
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**			
Client Contact	**Project Contact: Amy Dahl / Chelsey Cook**	**Site Contact: Nicky Moody**	**Date: 10/24/2018**	COC No: 1
AECOM	**Tel: (206) 438-2261 / (206) 438-2010**	**Laboratory Contact: Elaine-Walker**	**Carrier: Courier**	1 of 1 pages
1111 3rd Ave Suite 1600	**Analysis Turnaround Time**			
Seattle, WA 98101	Calendar (C) or Work Days (W) W			
Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR	☐ 21 days ☒ Other ASAP			
Project # 60566335 Study: **Subsurface Sediment**				
Sample Type:				

580-81298 Chain of Custody

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Grain size ASTM D7928/D6913	PCB Aroclors, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 160.3	Atterberg Limits ASTM D4318	Sample Specific Notes:
PDI-SC-S154 - 4 to 6	7/24/2018	15:45	SC		ED	3		x	x	x	x		Frozen 7/26/2018
PDI-SC-S185 - 5 to 6.5	7/26/2018	16:05	SC		ED	3		x	x	x	x		Frozen 7/26/2018
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column								AG	AG	WMG	WMG	AG	

Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid

Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
☐ *Return To Client* ☒ *Disposal By Lab* ☒ *Archive For 12 Months*

Special Instructions/QC Requirements & Comments: **Separate reports for each lab**

4.9

Relinquished by: Nicky Moody		Company: AECOM	Date/Time: 10/24/18 @ 1145	Received by:		Company: M.E.	Date/Time: 10/24/18 11:45
Relinquished by:		Company:	Date/Time:	Received by:		Company: TAL POR	Date/Time: 10/24/18 1240
Relinquished by:		Company: TAL POR	Date/Time: 10/24/18 1700	Received by:		Company: TASEA	Date/Time: 10-25-18 900

4-4.6/4.8

TestAmerica Seattle
[illegible] Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

580-81298 Chain of Custody

estAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	C No: 0-60813.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):	Page: Page 1 of 1
Address: 880 Riverside Parkway, ,	Due Date Requested: 11/9/2018		Job #: 580-81298-1
City: West Sacramento	TAT Requested (days):		
State, Zip: CA, 95605			
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:		
Email:	WO #:		
Project Name: Portland Harbor Pre-Remedial Design	Project #: 58012120		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X		X	
PDI-SC-S154-4to6 (580-81298-1)	7/24/18	15:45 Pacific		Solid		X	X	1	
PDI-SC-S185-5to6.5 (580-81298-2)	7/26/18	16:05 Pacific		Solid		X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification Unconfirmed	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: [signature]	Date/Time: 10/25/18 1800	Company TAOR	Received by: [signature] Date/Time: 10/26/18 9:45 Company TAMAC
Relinquished by:	Date/Time:	Company	Received by: Date/Time: Company
Relinquished by:	Date/Time:	Company	Received by: Date/Time: Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-81298-2

Login Number: 81298
List Number: 1
Creator: Antonson, Angeline D

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-81298-2

Login Number: 81298
List Number: 2
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 10/26/18 06:39 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3c
COC is present.	False	no coc Received
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

580-81298 Field Sheet

Job: 81298

Tracking # 4611 5676 4504 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier / Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations File in the job folder with the COC.

Notes: No COC Received. DH 10/26/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other____ (+0.7°C)

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: 492533

Sample Custody Seal: _____

Cooler ID: 10.3

Temp: Observed 0.3 Corrected 0.3

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☐	☐	☒
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: TG Date: 10/26/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

580-81298 Field Sheet

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Job: 61298

Tracking # 4611 5676 4704 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier / Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations File in the job folder with the COC.

Notes: No COC Received. DH 10/26/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other ____ (+0.7°C)

Ice X Wet X Gel ____ Other ____

Cooler Custody Seal: 492533

Sample Custody Seal: ____

Cooler ID: 193

Temp: Observed 0.3 Corrected 0.3

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☐	☐	☒
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: TLB Date: 10/26/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Isotope Dilution Summary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-81298-1	PDI-SC-S154-4to6	76	78	77	71	67	70	66	79
580-81298-2	PDI-SC-S185-5to6.5	48	49	52	51	48	50	46	59
MB 320-258637/1-A	Method Blank	84	84	85	93	91	91	92	80

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-81298-1	PDI-SC-S154-4to6	69	67	68	70	76	76	76
580-81298-2	PDI-SC-S185-5to6.5	52	52	49	57	61	66	51
MB 320-258637/1-A	Method Blank	73	73	87	74	77	70	74

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
HxCDD = 13C-1,2,3,4,7,8-HxCDD
HxCDF = 13C-1,2,3,4,7,8-HxCDF
HxDD = 13C-1,2,3,6,7,8-HxCDD
HxDF = 13C-1,2,3,6,7,8-HxCDF
HxCF = 13C-1,2,3,7,8,9-HxCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF = 13C-1,2,3,7,8-PeCDF
13CHxCF = 13C-2,3,4,6,7,8-HxCDF
PeCF = 13C-2,3,4,7,8-PeCDF
TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-258637/2-A	Lab Control Sample	84	87	86	93	91	89	90	78
LCSD 320-258637/3-A	Lab Control Sample Dup	84	83	86	82	82	83	84	79

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-258637/2-A	Lab Control Sample	70	70	86	71	73	68	75
LCSD 320-258637/3-A	Lab Control Sample Dup	75	75	86	70	78	72	76

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
HxCDD = 13C-1,2,3,4,7,8-HxCDD
HxCDF = 13C-1,2,3,4,7,8-HxCDF
HxDD = 13C-1,2,3,6,7,8-HxCDD
HxDF = 13C-1,2,3,6,7,8-HxCDF

Isotope Dilution Summary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-81298-2

HxCF = 13C-1,2,3,7,8,9-HxCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF = 13C-1,2,3,7,8-PeCDF
13CHxCF = 13C-2,3,4,6,7,8-HxCDF
PeCF = 13C-2,3,4,7,8-PeCDF
TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
OCDD = 13C-OCDD