TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77497-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Karen Mixon

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Authorized for release by:
6/19/2018 4:10:47 PM

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Job ID: 580-77497-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-77497-2

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

Six samples were received on 5/23/2018 1:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 0.6º C, 2.2º C, 3.8º C and 4.6º C.

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

This report contains results of Dioxins / Furans by Method 1613B, performed by 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-SG-S221 (580-77497-1), PDI-SG-S222 (580-77497-2), PDI-SG-S218 (580-77497-3), PDI-SG-S149 (580-77497-4), PDI-SG-S240 (580-77497-5) and PDI-SG-S240-D (580-77497-6) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/12/2018 and analyzed on 06/16/2018 and 06/17/2018.

Several analytes were detected in method blank MB 320-228676/1-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.

The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range: PDI-SG-S222 (580-77497-2). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

Method(s) HRMS-Sox: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-S221 (580-77497-1), PDI-SG-S222 (580-77497-2), PDI-SG-S218 (580-77497-3), PDI-SG-S149 (580-77497-4), PDI-SG-S240 (580-77497-5) and PDI-SG-S240-D (580-77497-6). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-228676 and 320-228676.

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: 580-77497-2

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.
E	Result exceeded calibration range.

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-SG-S221
Date Collected: 05/21/18 09:45
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-1
Matrix: Solid
Percent Solids: 38.7

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	0.15	B	0.0065	0.00092	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,4,6,7,8-HpCDF	0.030	B	0.0065	0.00049	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,4,7,8,9-HpCDF	0.0020	J B	0.0065	0.00043	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,4,7,8-HxCDD	0.0016	J B	0.0065	0.000081	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,4,7,8-HxCDF	0.0022	J B	0.0065	0.00012	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,6,7,8-HxCDD	0.0049	J B	0.0065	0.000080	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,6,7,8-HxCDF	0.0012	J B	0.0065	0.00011	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,7,8,9-HxCDD	0.0036	J B	0.0065	0.000072	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,7,8,9-HxCDF	0.00073	J B	0.0065	0.000088	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,7,8-PeCDD	0.00090	J q B	0.0065	0.00010	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
1,2,3,7,8-PeCDF	0.00068	J B	0.0065	0.000092	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
2,3,4,6,7,8-HxCDF	0.00072	J B	0.0065	0.000088	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
2,3,4,7,8-PeCDF	0.00064	J B	0.0065	0.000099	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
2,3,7,8-TCDD	0.0014	B	0.0013	0.000087	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
OCDD	1.3	B	0.013	0.00038	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1
OCDF	0.11	B	0.013	0.000080	ug/Kg	☼	06/12/18 13:16	06/16/18 19:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*23 - 140*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*41*		*28 - 143*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*57*		*26 - 138*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,4,7,8-HxCDD	*68*		*32 - 141*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,4,7,8-HxCDF	*73*		*26 - 152*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,6,7,8-HxCDF	*67*		*26 - 123*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,7,8,9-HxCDF	*70*		*29 - 147*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*25 - 181*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-2,3,4,6,7,8-HxCDF	*71*		*28 - 136*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*06/12/18 13:16*	*06/16/18 19:25*	*1*
13C-OCDD	*56*		*17 - 157*	*06/12/18 13:16*	*06/16/18 19:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*118*		*35 - 197*	*06/12/18 13:16*	*06/16/18 19:25*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00089	J B	0.0013	0.00027	ug/Kg	☼	06/12/18 13:16	06/17/18 10:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*71*		*24 - 169*	*06/12/18 13:16*	*06/17/18 10:36*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*104*		*35 - 197*	*06/12/18 13:16*	*06/17/18 10:36*	*1*

Client Sample ID: PDI-SG-S222
Date Collected: 05/21/18 11:26
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-2
Matrix: Solid
Percent Solids: 48.0

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	0.54	B	0.0052	0.0023	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,4,6,7,8-HpCDF	0.11	B	0.0052	0.0011	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,4,7,8,9-HpCDF	0.0058	B	0.0052	0.0014	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,4,7,8-HxCDD	0.0032	J B	0.0052	0.00015	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,4,7,8-HxCDF	0.0057	B	0.0052	0.00025	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,6,7,8-HxCDD	0.014	B	0.0052	0.00015	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,6,7,8-HxCDF	0.0040	J B	0.0052	0.00024	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,7,8,9-HxCDD	0.0075	B	0.0052	0.00014	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,7,8,9-HxCDF	0.00072	J B	0.0052	0.00018	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,7,8-PeCDD	0.0019	J B	0.0052	0.00013	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
1,2,3,7,8-PeCDF	0.0018	J B	0.0052	0.00020	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
2,3,4,6,7,8-HxCDF	0.0017	J B	0.0052	0.00020	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
2,3,4,7,8-PeCDF	0.0020	J B	0.0052	0.00022	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
2,3,7,8-TCDD	0.0053	B	0.0010	0.000088	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
OCDD	6.8	E B	0.010	0.0015	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1
OCDF	0.82	B	0.010	0.00023	ug/Kg	☼	06/12/18 13:17	06/16/18 20:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*53*		*23 - 140*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*40*		*28 - 143*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*45*		*26 - 138*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,4,7,8-HxCDD	*70*		*32 - 141*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,4,7,8-HxCDF	*77*		*26 - 152*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*28 - 130*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,6,7,8-HxCDF	*71*		*26 - 123*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,7,8,9-HxCDF	*74*		*29 - 147*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,7,8-PeCDD	*67*		*25 - 181*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-1,2,3,7,8-PeCDF	*68*		*24 - 185*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-2,3,4,6,7,8-HxCDF	*75*		*28 - 136*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*06/12/18 13:17*	*06/16/18 20:14*	*1*
13C-OCDD	*57*		*17 - 157*	*06/12/18 13:17*	*06/16/18 20:14*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*06/12/18 13:17*	*06/16/18 20:14*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.0017	B	0.0010	0.00026	ug/Kg	☼	06/12/18 13:17	06/17/18 11:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*73*		*24 - 169*	*06/12/18 13:17*	*06/17/18 11:14*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*98*		*35 - 197*	*06/12/18 13:17*	*06/17/18 11:14*	*1*

Client Sample ID: PDI-SG-S218
Date Collected: 05/21/18 13:16
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-3
Matrix: Solid
Percent Solids: 63.4

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	0.082	B	0.0039	0.00042	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,4,6,7,8-HpCDF	0.070	B	0.0039	0.00032	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,4,7,8,9-HpCDF	0.0018	J B	0.0039	0.00037	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,4,7,8-HxCDD	0.00090	J B	0.0039	0.000056	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,4,7,8-HxCDF	0.0018	J B	0.0039	0.00014	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,6,7,8-HxCDD	0.0034	J B	0.0039	0.000056	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,6,7,8-HxCDF	0.0064	B	0.0039	0.00013	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,7,8,9-HxCDD	0.0020	J B	0.0039	0.000051	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,7,8,9-HxCDF	0.00060	J B	0.0039	0.000099	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,7,8-PeCDD	0.00055	J B	0.0039	0.000051	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
1,2,3,7,8-PeCDF	0.00061	J B	0.0039	0.00014	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
2,3,4,6,7,8-HxCDF	0.00095	J B	0.0039	0.00011	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
2,3,4,7,8-PeCDF	0.00064	J B	0.0039	0.00015	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
2,3,7,8-TCDD	0.00049	J B q	0.00078	0.000037	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
OCDD	1.1	B	0.0078	0.00028	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1
OCDF	0.083	B	0.0078	0.000057	ug/Kg	☼	06/12/18 13:16	06/16/18 21:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*46*		*23 - 140*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*39*		*28 - 143*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*46*		*26 - 138*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,4,7,8-HxCDD	*60*		*32 - 141*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,4,7,8-HxCDF	*63*		*26 - 152*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,6,7,8-HxCDD	*52*		*28 - 130*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,7,8,9-HxCDF	*61*		*29 - 147*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,7,8-PeCDD	*54*		*25 - 181*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-1,2,3,7,8-PeCDF	*57*		*24 - 185*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-2,3,4,6,7,8-HxCDF	*62*		*28 - 136*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-2,3,4,7,8-PeCDF	*58*		*21 - 178*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-2,3,7,8-TCDD	*56*		*25 - 164*	*06/12/18 13:16*	*06/16/18 21:02*	*1*
13C-OCDD	*47*		*17 - 157*	*06/12/18 13:16*	*06/16/18 21:02*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*06/12/18 13:16*	*06/16/18 21:02*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00041	J B	0.00078	0.00021	ug/Kg	☼	06/12/18 13:16	06/17/18 11:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*06/12/18 13:16*	*06/17/18 11:52*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*06/12/18 13:16*	*06/17/18 11:52*	*1*

Client Sample ID: PDI-SG-S149
Date Collected: 05/22/18 11:10
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-4
Matrix: Solid
Percent Solids: 76.4

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	0.035	B	0.0033	0.00017	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,4,6,7,8-HpCDF	0.0051	B	0.0033	0.000096	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,4,7,8,9-HpCDF	0.00052	J B	0.0033	0.00010	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,4,7,8-HxCDD	0.00027	J B	0.0033	0.000025	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,4,7,8-HxCDF	0.00045	J B	0.0033	0.000035	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,6,7,8-HxCDD	0.0011	J B	0.0033	0.000025	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,6,7,8-HxCDF	0.00020	J B	0.0033	0.000034	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,7,8,9-HxCDD	0.00060	J B	0.0033	0.000022	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,7,8,9-HxCDF	0.00028	J B	0.0033	0.000024	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,7,8-PeCDD	0.00015	J B	0.0033	0.000027	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
1,2,3,7,8-PeCDF	0.00015	J B	0.0033	0.000025	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
2,3,4,6,7,8-HxCDF	0.00013	J B	0.0033	0.000026	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
2,3,4,7,8-PeCDF	0.00014	J B	0.0033	0.000029	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
2,3,7,8-TCDD	0.00022	J B q	0.00066	0.000020	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
2,3,7,8-TCDF	0.00029	J B	0.00066	0.000021	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
OCDD	0.38	B	0.0066	0.00011	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1
OCDF	0.017	B	0.0066	0.000029	ug/Kg	☼	06/12/18 13:16	06/16/18 21:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*59*		*23 - 140*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*51*		*28 - 143*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*62*		*26 - 138*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,4,7,8-HxCDD	*71*		*32 - 141*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*26 - 152*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,6,7,8-HxCDF	*66*		*26 - 123*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,7,8,9-HxCDF	*72*		*29 - 147*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,7,8-PeCDD	*63*		*25 - 181*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-2,3,4,6,7,8-HxCDF	*73*		*28 - 136*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-2,3,4,7,8-PeCDF	*64*		*21 - 178*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-2,3,7,8-TCDF	*72*		*24 - 169*	*06/12/18 13:16*	*06/16/18 21:51*	*1*
13C-OCDD	*56*		*17 - 157*	*06/12/18 13:16*	*06/16/18 21:51*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*112*		*35 - 197*	*06/12/18 13:16*	*06/16/18 21:51*	*1*

Client Sample ID: PDI-SG-S240
Date Collected: 05/22/18 09:36
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-5
Matrix: Solid
Percent Solids: 74.9

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	0.017	B	0.0033	0.00010	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,4,6,7,8-HpCDF	0.0060	B	0.0033	0.00011	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,4,7,8,9-HpCDF	0.00062	J B	0.0033	0.00011	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,4,7,8-HxCDD	0.00046	J B	0.0033	0.000018	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,4,7,8-HxCDF	0.0016	J B	0.0033	0.000035	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,6,7,8-HxCDD	0.0012	J B	0.0033	0.000018	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,6,7,8-HxCDF	0.00058	J B	0.0033	0.000035	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,7,8,9-HxCDD	0.0012	J B	0.0033	0.000016	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,7,8,9-HxCDF	0.00037	J B	0.0033	0.000024	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,7,8-PeCDD	0.00030	J B	0.0033	0.000048	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
1,2,3,7,8-PeCDF	0.00030	J B	0.0033	0.000048	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
2,3,4,6,7,8-HxCDF	0.00065	J B	0.0033	0.000026	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
2,3,4,7,8-PeCDF	0.00052	J B	0.0033	0.000053	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
2,3,7,8-TCDD	0.0032	B	0.00067	0.000032	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
OCDD	0.11	B	0.0067	0.000052	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1
OCDF	0.013	B	0.0067	0.000031	ug/Kg	☼	06/12/18 13:16	06/16/18 22:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*54*		*23 - 140*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*46*		*28 - 143*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*60*		*26 - 138*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,4,7,8-HxCDD	*65*		*32 - 141*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,4,7,8-HxCDF	*69*		*26 - 152*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,6,7,8-HxCDD	*56*		*28 - 130*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,6,7,8-HxCDF	*60*		*26 - 123*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,7,8,9-HxCDF	*69*		*29 - 147*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,7,8-PeCDD	*60*		*25 - 181*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-1,2,3,7,8-PeCDF	*63*		*24 - 185*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-2,3,4,7,8-PeCDF	*64*		*21 - 178*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-2,3,7,8-TCDD	*62*		*25 - 164*	*06/12/18 13:16*	*06/16/18 22:39*	*1*
13C-OCDD	*46*		*17 - 157*	*06/12/18 13:16*	*06/16/18 22:39*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*114*		*35 - 197*	*06/12/18 13:16*	*06/16/18 22:39*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00024	J B	0.00067	0.00012	ug/Kg	☼	06/12/18 13:16	06/17/18 12:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*74*		*24 - 169*	*06/12/18 13:16*	*06/17/18 12:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*06/12/18 13:16*	*06/17/18 12:30*	*1*

Client Sample ID: PDI-SG-S240-D

Date Collected: 05/22/18 09:38
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-6

Matrix: Solid
Percent Solids: 76.0

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	0.012	B	0.0032	0.000080	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,4,6,7,8-HpCDF	0.0046	B	0.0032	0.000069	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,4,7,8,9-HpCDF	0.00069	J B q	0.0032	0.000068	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,4,7,8-HxCDD	0.00032	J B	0.0032	0.000016	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,4,7,8-HxCDF	0.0011	J B	0.0032	0.000039	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,6,7,8-HxCDD	0.00067	J B q	0.0032	0.000017	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,6,7,8-HxCDF	0.00042	J B	0.0032	0.000038	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,7,8,9-HxCDD	0.00070	J B	0.0032	0.000015	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,7,8,9-HxCDF	0.00046	J B	0.0032	0.000028	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,7,8-PeCDD	0.00016	J B	0.0032	0.000033	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
1,2,3,7,8-PeCDF	0.00025	J B	0.0032	0.000026	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
2,3,4,6,7,8-HxCDF	0.00045	J B	0.0032	0.000029	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
2,3,4,7,8-PeCDF	0.00034	J B	0.0032	0.000029	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
2,3,7,8-TCDD	0.00013	J B q	0.00064	0.000019	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
OCDD	0.094	B	0.0064	0.000049	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1
OCDF	0.0097	B	0.0064	0.000032	ug/Kg	☼	06/12/18 13:16	06/16/18 23:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*23 - 140*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*28 - 143*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*63*		*26 - 138*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,4,7,8-HxCDD	*67*		*32 - 141*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,4,7,8-HxCDF	*71*		*26 - 152*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,6,7,8-HxCDD	*55*		*28 - 130*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,6,7,8-HxCDF	*62*		*26 - 123*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,7,8,9-HxCDF	*69*		*29 - 147*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,7,8-PeCDD	*63*		*25 - 181*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-2,3,4,7,8-PeCDF	*64*		*21 - 178*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-2,3,7,8-TCDD	*65*		*25 - 164*	*06/12/18 13:16*	*06/16/18 23:28*	*1*
13C-OCDD	*49*		*17 - 157*	*06/12/18 13:16*	*06/16/18 23:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*06/12/18 13:16*	*06/16/18 23:28*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00016	J B	0.00064	0.00011	ug/Kg	☼	06/12/18 13:16	06/17/18 13:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*73*		*24 - 169*	*06/12/18 13:16*	*06/17/18 13:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*06/12/18 13:16*	*06/17/18 13:08*	*1*

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

Lab Sample ID: MB 320-228676/1-A
Matrix: Solid
Analysis Batch: 229415

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 228676

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000240	J	0.0050	0.000030	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,4,6,7,8-HpCDF	0.000176	J	0.0050	0.000025	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,4,7,8,9-HpCDF	0.000448	J	0.0050	0.000032	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,4,7,8-HxCDD	0.000201	J q	0.0050	0.000028	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,4,7,8-HxCDF	0.000168	J	0.0050	0.000054	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,6,7,8-HxCDD	0.000131	J	0.0050	0.000028	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,6,7,8-HxCDF	0.000128	J	0.0050	0.000051	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,7,8,9-HxCDD	0.000109	J	0.0050	0.000025	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,7,8,9-HxCDF	0.000601	J	0.0050	0.000040	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,7,8-PeCDD	0.0000910	J q	0.0050	0.000047	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
1,2,3,7,8-PeCDF	0.000180	J	0.0050	0.000037	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
2,3,4,6,7,8-HxCDF	0.0000926	J	0.0050	0.000039	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
2,3,4,7,8-PeCDF	0.000138	J	0.0050	0.000041	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
2,3,7,8-TCDD	0.000304	J q	0.0010	0.000051	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
2,3,7,8-TCDF	0.000188	J	0.0010	0.000037	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
OCDD	0.000847	J	0.010	0.000039	ug/Kg		06/12/18 13:16	06/16/18 17:00	1
OCDF	0.000365	J	0.010	0.000046	ug/Kg		06/12/18 13:16	06/16/18 17:00	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*65*		*23 - 140*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*62*		*28 - 143*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*66*		*26 - 138*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,4,7,8-HxCDD	*76*		*32 - 141*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,4,7,8-HxCDF	*80*		*26 - 152*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,6,7,8-HxCDD	*67*		*28 - 130*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,6,7,8-HxCDF	*73*		*26 - 123*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,7,8,9-HxCDF	*74*		*29 - 147*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,7,8-PeCDD	*67*		*25 - 181*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-1,2,3,7,8-PeCDF	*70*		*24 - 185*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-2,3,4,6,7,8-HxCDF	*78*		*28 - 136*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-2,3,4,7,8-PeCDF	*71*		*21 - 178*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-2,3,7,8-TCDD	*65*		*25 - 164*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-2,3,7,8-TCDF	*76*		*24 - 169*	*06/12/18 13:16*	*06/16/18 17:00*	*1*
13C-OCDD	*62*		*17 - 157*	*06/12/18 13:16*	*06/16/18 17:00*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*117*		*35 - 197*	*06/12/18 13:16*	*06/16/18 17:00*	*1*

Lab Sample ID: LCS 320-228676/2-A
Matrix: Solid
Analysis Batch: 229415

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228676

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.102		ug/Kg		102	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.105		ug/Kg		105	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.0992		ug/Kg		99	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.101		ug/Kg		101	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.0990		ug/Kg		99	72 - 134

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

Lab Sample ID: LCS 320-228676/2-A
Matrix: Solid
Analysis Batch: 229415

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228676

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2,3,6,7,8-HxCDD			0.100	0.0998		ug/Kg		100	76 - 134		
1,2,3,6,7,8-HxCDF			0.100	0.103		ug/Kg		103	84 - 130		
1,2,3,7,8,9-HxCDD			0.100	0.106		ug/Kg		106	64 - 162		
1,2,3,7,8,9-HxCDF			0.100	0.102		ug/Kg		102	78 - 130		
1,2,3,7,8-PeCDD			0.100	0.102		ug/Kg		102	70 - 142		
1,2,3,7,8-PeCDF			0.100	0.104		ug/Kg		104	80 - 134		
2,3,4,6,7,8-HxCDF			0.100	0.100		ug/Kg		100	70 - 156		
2,3,4,7,8-PeCDF			0.100	0.104		ug/Kg		104	68 - 160		
2,3,7,8-TCDD			0.0200	0.0214		ug/Kg		107	67 - 158		
2,3,7,8-TCDF			0.0200	0.0205		ug/Kg		103	75 - 158		
OCDD			0.200	0.202		ug/Kg		101	78 - 144		
OCDF			0.200	0.195		ug/Kg		97	63 - 170		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*61*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*58*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*64*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*69*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*75*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*62*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*68*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*71*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*66*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*67*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*71*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*66*		*13 - 328*
13C-2,3,7,8-TCDD	*63*		*20 - 175*
13C-2,3,7,8-TCDF	*72*		*22 - 152*
13C-OCDD	*59*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*116*		*31 - 191*

Lab Sample ID: LCSD 320-228676/3-A
Matrix: Solid
Analysis Batch: 229415

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228676

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	0.104		ug/Kg		104	70 - 140	2	50
1,2,3,4,6,7,8-HpCDF			0.100	0.106		ug/Kg		106	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF			0.100	0.102		ug/Kg		102	78 - 138	3	50
1,2,3,4,7,8-HxCDD			0.100	0.105		ug/Kg		105	70 - 164	4	50
1,2,3,4,7,8-HxCDF			0.100	0.103		ug/Kg		103	72 - 134	4	50
1,2,3,6,7,8-HxCDD			0.100	0.0990		ug/Kg		99	76 - 134	1	50
1,2,3,6,7,8-HxCDF			0.100	0.104		ug/Kg		104	84 - 130	2	50
1,2,3,7,8,9-HxCDD			0.100	0.106		ug/Kg		106	64 - 162	0	50
1,2,3,7,8,9-HxCDF			0.100	0.104		ug/Kg		104	78 - 130	2	50
1,2,3,7,8-PeCDD			0.100	0.103		ug/Kg		103	70 - 142	1	50

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

Lab Sample ID: LCSD 320-228676/3-A
Matrix: Solid
Analysis Batch: 229415

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228676

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.105		ug/Kg		105	80 - 134	0	50
2,3,4,6,7,8-HxCDF			0.100	0.100		ug/Kg		100	70 - 156	0	50
2,3,4,7,8-PeCDF			0.100	0.105		ug/Kg		105	68 - 160	1	50
2,3,7,8-TCDD			0.0200	0.0217		ug/Kg		109	67 - 158	1	50
2,3,7,8-TCDF			0.0200	0.0206		ug/Kg		103	75 - 158	0	50
OCDD			0.200	0.202		ug/Kg		101	78 - 144	0	50
OCDF			0.200	0.197		ug/Kg		99	63 - 170	1	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*68*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*65*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*71*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*77*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*82*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*70*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*75*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*79*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*70*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*73*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*81*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*72*		*13 - 328*
13C-2,3,7,8-TCDD	*68*		*20 - 175*
13C-2,3,7,8-TCDF	*78*		*22 - 152*
13C-OCDD	*65*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*114*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-77497-2

Client Sample ID: PDI-SG-S221
Date Collected: 05/21/18 09:45
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-1
Matrix: Solid
Percent Solids: 38.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229548	06/17/18 10:36	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 19:25	SMA	TAL SAC

Client Sample ID: PDI-SG-S222
Date Collected: 05/21/18 11:26
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-2
Matrix: Solid
Percent Solids: 48.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228676	06/12/18 13:17	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229548	06/17/18 11:14	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:17	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 20:14	SMA	TAL SAC

Client Sample ID: PDI-SG-S218
Date Collected: 05/21/18 13:16
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-3
Matrix: Solid
Percent Solids: 63.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229548	06/17/18 11:52	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 21:02	SMA	TAL SAC

Client Sample ID: PDI-SG-S149
Date Collected: 05/22/18 11:10
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-4
Matrix: Solid
Percent Solids: 76.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 21:51	SMA	TAL SAC

Client Sample ID: PDI-SG-S240
Date Collected: 05/22/18 09:36
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-5
Matrix: Solid
Percent Solids: 74.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229548	06/17/18 12:30	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 22:39	SMA	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77497-2

Client Sample ID: PDI-SG-S240-D

Date Collected: 05/22/18 09:38
Date Received: 05/23/18 13:40

Lab Sample ID: 580-77497-6

Matrix: Solid
Percent Solids: 76.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229548	06/17/18 13:08	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			228676	06/12/18 13:16	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229415	06/16/18 23:28	SMA	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM
TestAmerica Job ID: 580-77497-2
Project/Site: Portland Harbor Pre-Remedial Design

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
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
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
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
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	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
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	07-31-18
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-18
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	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
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: 580-77497-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77497-1	PDI-SG-S221	Solid	05/21/18 09:45	05/23/18 13:40
580-77497-2	PDI-SG-S222	Solid	05/21/18 11:26	05/23/18 13:40
580-77497-3	PDI-SG-S218	Solid	05/21/18 13:16	05/23/18 13:40
580-77497-4	PDI-SG-S149	Solid	05/22/18 11:10	05/23/18 13:40
580-77497-5	PDI-SG-S240	Solid	05/22/18 09:36	05/23/18 13:40
580-77497-6	PDI-SG-S240-D	Solid	05/22/18 09:38	05/23/18 13:40

SURFACE 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: Jennifer Ray** **Laboratory Contact: Elnine-Walker**	**5/23/2018** **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: Surface Sediment-SMA	**Analysis Turnaround Time** Calendar (C) or Work Days (W) [x] 21 days [ ] Other			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060	Archive Archive -20 C	Sample Specific Notes:
PDI-SG-S221	5/21/2018	9:45	SS	MS/MSD	NM	9		X	X	X	X	X	
PDI-SG-S222	5/21/2018	11:26	SS		NM	5		X	X	X	X	X	
PDI-SG-S218	5/21/2018	13:16	SS		NM	5		X	X	X	X	X	
PDI-SG-S149	5/22/2018	11:10	SS		AM	5		X	X	X	X	X	
PDI-SG-S240	5/22/2018	9:36	SS		MM	5		X	X	X	X	X	
PDI-SG-S240-D	5/22/2018	9:38	SS		MM	4		X	X		X	X	

580-77497 Chain of Custody

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column

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

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

Sample Disposal
[ ] *Return To Client* [X] *isposal By Lab* [X] *rchive For 12 Months*

Special Instructions/QC Requirements & Comments:
Separate reports for each lab
SMA Study samples - Log in seperately from SS Study samples

3.8 /4.6/2.2/0.6

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	AECOM	5/23/18 1255		M.E.	5/23/18 1255
	M.E.	5/23/18 1340	Tom Blanford	TA-P	5/23/18 1340
	TA-POR	5/23/18 1700			

SURFACE 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** **Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ [x] 21 days [ ] Other _____	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**5/23/2018** **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: Surface Sediment-SMA				

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060	Archive Archive -20 C	Sample Specific Notes:
PDI-SG-S221	5/21/2018	9:45	SS	MS/MSD	NM	9		X	X	X	X	X	
PDI-SG-S222	5/21/2018	11:26	SS		NM	5		X	X	X	X	X	
PDI-SG-S218	5/21/2018	13:16	SS		NM	5		X	X	X	X	X	
PDI-SG-S149	5/22/2018	11:10	SS		AM	5		X	X	X	X	X	
PDI-SG-S240	5/22/2018	9:36	SS		MM	5		X	X	X	X	X	
PDI-SG-S240-D	5/22/2018	9:38	SS		MM	4		X	X		X	X	

580-77497 Chain of Custody

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column

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

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

Sample Disposal

[ ] *Return To Client* [X] *Disposal By Lab* [X] *Archive For 12 Months*

Special Instructions/QC Requirements & Comments:

Separate reports for each lab

SMA Study samples - Log in seperately from SS Study samples

3.8 / 4.6 / 2.4 / 0.6

Relinquished by:	Company: AECOM	Date/Time: 5/23/18 1255	Received by:	Company: M. E.	Date/Time: 5/23/18 1255
Relinquished by:	Company: M. E.	Date/Time: 5/23/18 1340	Received by: Tom Blanton	Company: TA-P	Date/Time: 5/23/18 1340
Relinquished by:	Company: TAPOR	Date/Time: 5/23/18 1700	Received by: B. Hall	Company: SEA TA	Date/Time: 5.24.18 0930

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-55635.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77497-4
Address: 880 Riverside Parkway,	Due Date Requested: 6/11/2018			
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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S221 (580-77497-1)	5/21/18	09:45 Pacific		Solid			X	2	
PDI-SG-S222 (580-77497-2)	5/21/18	11:26 Pacific		Solid			X	2	
PDI-SG-S218 (580-77497-3)	5/21/18	13:16 Pacific		Solid			X	2	
PDI-SG-S149 (580-77497-4)	5/22/18	11:10 Pacific		Solid			X	2	
PDI-SG-S240 (580-77497-5)	5/22/18	09:36 Pacific		Solid			X	2	

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 complicance to TestAmerica Laboratories, Inc.

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/24/18 1700	TAL-SAC		25 may 18 1100	TA-WSac
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: SM	Cooler Temperature(s) °C and Other Remarks: 4.4 °C

Ver: 09/20/2016

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-55635.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77497-2
Address: 880 Riverside Parkway,	Due Date Requested: 6/11/2018			
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	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S221 (580-77497-1)	5/21/18	09:45 Pacific		Solid			X	2	
PDI-SG-S222 (580-77497-2)	5/21/18	11:26 Pacific		Solid			X	2	
PDI-SG-S218 (580-77497-3)	5/21/18	13:16 Pacific		Solid			X	2	
PDI-SG-S149 (580-77497-4)	5/22/18	11:10 Pacific		Solid			X	2	
PDI-SG-S240 (580-77497-5)	5/22/18	09:36 Pacific		Solid			X	2	

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 complicance to TestAmerica Laboratories, Inc.

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	5/24/18 1700	TABOR		25-May-18 1100	TALS
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:
		4.4 °C

Ver: 09/20/2016

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-55711.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77497-2
Address: 680 Riverside Parkway,	Due Date Requested: 6/11/2018			Preservation Codes:
City: West Sacramento	TAT Requested (days):			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)
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			Other:
Email:	WO #:			
Project Name: Portland Harbor Pre-Remedial Design	Project #: 58012120			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S240-D (580-77497-6)	5/22/18	09:38 Pacific		Solid			X	2	

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/24/18 1700	TAKE		5/25/18 11:00	TAWSTE
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
✓ Yes ☐ No	Seals	2.6°C, 0.4°C

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77497-2

Login Number: 77497
List Number: 1
Creator: O'Connell, Jason I

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.	True	
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: 580-77497-2

Login Number: 77497
List Number: 4
Creator: Gooch, Mayce

List Source: TestAmerica Sacramento
List Creation: 05/25/18 12:19 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	2.6c 4.4c
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?	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

580-77497 Field Sheet

Job: _____

Tracking # 4423 0750 3676 SO / (PO) / FO / UPS / 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: _____

Therm. ID: **AK-2 / AK-3 / (AK-5) / AK-6 / HACCP / Other** _____

Ice Y Wet Y Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: 1 of 2

Temp: Observed 2.6

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: MG Date: 5/25/18 Time 900

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

F2B @ 1240
F2C @ 1240

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job: _____

Tracking # 4423 0750 3687 SO (PO) / FO / UPS / 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: _____

Therm. ID: **AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other** ____

Ice ✓ Wet ✓ Gel ____ Other ____

Cooler Custody Seal: Sent

Sample Custody Seal: —

Cooler ID: 2 of 2

Temp: Observed 4.4 °C

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: _____ Date: 25 May 18 Time 11:05

*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: 580-77497-2

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)
580-77497-1	PDI-SG-S221	56	41	57	68	73	59	67	70
580-77497-1 - RA	PDI-SG-S221								
580-77497-2	PDI-SG-S222	53	40	45	70	77	58	71	74
580-77497-2 - RA	PDI-SG-S222								
580-77497-3	PDI-SG-S218	46	39	46	60	63	52	58	61
580-77497-3 - RA	PDI-SG-S218								
580-77497-4	PDI-SG-S149	59	51	62	71	72	59	66	72
580-77497-5	PDI-SG-S240	54	46	60	65	69	56	60	69
580-77497-5 - RA	PDI-SG-S240								
580-77497-6	PDI-SG-S240-D	56	49	63	67	71	55	62	69
580-77497-6 - RA	PDI-SG-S240-D								
MB 320-228676/1-A	Method Blank	65	62	66	76	80	67	73	74

		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)
580-77497-1	PDI-SG-S221	62	65	71	66	63		56
580-77497-1 - RA	PDI-SG-S221						71	
580-77497-2	PDI-SG-S222	67	68	75	66	64		57
580-77497-2 - RA	PDI-SG-S222						73	
580-77497-3	PDI-SG-S218	54	57	62	58	56		47
580-77497-3 - RA	PDI-SG-S218						63	
580-77497-4	PDI-SG-S149	63	65	73	64	64	72	56
580-77497-5	PDI-SG-S240	60	63	68	64	62		46
580-77497-5 - RA	PDI-SG-S240						74	
580-77497-6	PDI-SG-S240-D	63	64	68	64	65		49
580-77497-6 - RA	PDI-SG-S240-D						73	
MB 320-228676/1-A	Method Blank	67	70	78	71	65	76	62

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77497-2

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 (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-228676/2-A	Lab Control Sample	61	58	64	69	75	62	68	71
LCSD 320-228676/3-A	Lab Control Sample Dup	68	65	71	77	82	70	75	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 320-228676/2-A	Lab Control Sample	66	67	71	66	63	72	59	
LCSD 320-228676/3-A	Lab Control Sample Dup	70	73	81	72	68	78	65	

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