TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-79202-2

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM
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Attn: Amy Dahl

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Authorized for release by:
9/13/2018 3:37:34 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 580-79202-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-79202-2

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

Five samples were received on 7/30/2018 1:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

The following samples were activated by the client for all on hold analysis on 8/16/18: PDI-SG-B485 (580-79202-1), PDI-SG-B484 (580-79202-2), PDI-SG-B482 (580-79202-3), PDI-SG-B487 (580-79202-4), PDI-SG-B488 (580-79202-5) and PDI-SG-B486 (580-79202-6).

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

This report contains results for Dioxins/Furans by Method 1613B, 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-SG-B485 (580-79202-1), PDI-SG-B484 (580-79202-2), PDI-SG-B482 (580-79202-3), PDI-SG-B487 (580-79202-4), PDI-SG-B488 (580-79202-5) and PDI-SG-B486 (580-79202-6) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 09/05/2018 and analyzed on 09/11/2018 and 09/12/2018.

Several analytes were detected in method blank MB 320-243983/1-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-SG-B485 (580-79202-1), PDI-SG-B484 (580-79202-2), PDI-SG-B482 (580-79202-3), PDI-SG-B487 (580-79202-4), (CCV 320-244812/13), (LCS 320-243983/2-A), (LCSD 320-243983/3-A) and (MB 320-243983/1-A). 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.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B485 (580-79202-1), PDI-SG-B484 (580-79202-2), PDI-SG-B482 (580-79202-3), PDI-SG-B487 (580-79202-4), PDI-SG-B488 (580-79202-5) and PDI-SG-B486

Job ID: 580-79202-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

(580-79202-6). 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: 580-79202-2

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-SG-B485
Date Collected: 07/27/18 12:45
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-1
Matrix: Solid
Percent Solids: 54.0

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	0.031	B	0.0045	0.00016	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,4,6,7,8-HpCDF	0.0056	B	0.0045	0.000092	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,4,7,8,9-HpCDF	0.00042	J B	0.0045	0.000099	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,4,7,8-HxCDD	0.00050	J B	0.0045	0.000049	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,4,7,8-HxCDF	0.00050	J	0.0045	0.000049	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,6,7,8-HxCDD	0.0018	J q	0.0045	0.000047	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,6,7,8-HxCDF	0.00031	J	0.0045	0.000047	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,7,8,9-HxCDD	0.0013	J B	0.0045	0.000044	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,7,8,9-HxCDF	0.00014	J q B	0.0045	0.000033	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,7,8-PeCDD	0.00029	J	0.0045	0.000043	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
1,2,3,7,8-PeCDF	0.00018	J	0.0045	0.000041	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
2,3,4,6,7,8-HxCDF	0.00018	J	0.0045	0.000036	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
2,3,4,7,8-PeCDF	0.00018	J	0.0045	0.000042	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
2,3,7,8-TCDD	ND		0.00091	0.000031	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
2,3,7,8-TCDF	0.00081	J B	0.00091	0.000022	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
OCDD	0.28	B	0.0091	0.00011	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1
OCDF	0.022	B	0.0091	0.000039	ug/Kg	☼	09/05/18 15:15	09/11/18 02:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*63*		*23 - 140*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*52*		*28 - 143*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*62*		*26 - 138*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,4,7,8-HxCDD	*55*		*32 - 141*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,4,7,8-HxCDF	*59*		*26 - 152*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*28 - 130*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,6,7,8-HxCDF	*60*		*26 - 123*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,7,8,9-HxCDF	*62*		*29 - 147*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,7,8-PeCDD	*57*		*25 - 181*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-1,2,3,7,8-PeCDF	*55*		*24 - 185*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-2,3,4,6,7,8-HxCDF	*62*		*28 - 136*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-2,3,4,7,8-PeCDF	*57*		*21 - 178*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-2,3,7,8-TCDF	*62*		*24 - 169*	*09/05/18 15:15*	*09/11/18 02:24*	*1*
13C-OCDD	*53*		*17 - 157*	*09/05/18 15:15*	*09/11/18 02:24*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*121*		*35 - 197*	*09/05/18 15:15*	*09/11/18 02:24*	*1*

Client Sample ID: PDI-SG-B484
Date Collected: 07/27/18 15:15
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-2
Matrix: Solid
Percent Solids: 54.3

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	0.023	B	0.0046	0.00014	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,4,6,7,8-HpCDF	0.0046	B	0.0046	0.00011	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,4,7,8,9-HpCDF	0.00034	J B	0.0046	0.00011	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,4,7,8-HxCDD	0.00044	J B	0.0046	0.000033	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,4,7,8-HxCDF	0.00037	J	0.0046	0.000043	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0046	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,6,7,8-HxCDF	0.00024	J	0.0046	0.000041	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,7,8,9-HxCDD	0.00088	J B	0.0046	0.000030	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,7,8,9-HxCDF	0.00014	J B	0.0046	0.000027	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,7,8-PeCDD	0.00017	J	0.0046	0.000043	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
1,2,3,7,8-PeCDF	0.00015	J	0.0046	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
2,3,4,6,7,8-HxCDF	0.00016	J	0.0046	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
2,3,4,7,8-PeCDF	0.00014	J	0.0046	0.000035	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
2,3,7,8-TCDD	0.00015	J q	0.00091	0.000033	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
2,3,7,8-TCDF	0.00029	J B	0.00091	0.000020	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
OCDD	0.20	B	0.0091	0.000098	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1
OCDF	0.019	B	0.0091	0.000047	ug/Kg	☼	09/05/18 15:15	09/11/18 03:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*51*		*23 - 140*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*41*		*28 - 143*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*52*		*26 - 138*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,4,7,8-HxCDD	*47*		*32 - 141*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,4,7,8-HxCDF	*48*		*26 - 152*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,6,7,8-HxCDD	*48*		*28 - 130*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,6,7,8-HxCDF	*49*		*26 - 123*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,7,8,9-HxCDF	*55*		*29 - 147*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,7,8-PeCDD	*51*		*25 - 181*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-1,2,3,7,8-PeCDF	*51*		*24 - 185*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-2,3,4,6,7,8-HxCDF	*52*		*28 - 136*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-2,3,4,7,8-PeCDF	*52*		*21 - 178*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-2,3,7,8-TCDD	*60*		*25 - 164*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-2,3,7,8-TCDF	*62*		*24 - 169*	*09/05/18 15:15*	*09/11/18 03:10*	*1*
13C-OCDD	*39*		*17 - 157*	*09/05/18 15:15*	*09/11/18 03:10*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*122*		*35 - 197*	*09/05/18 15:15*	*09/11/18 03:10*	*1*

Client Sample ID: PDI-SG-B482
Date Collected: 07/27/18 14:18
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-3
Matrix: Solid
Percent Solids: 59.4

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	0.018	B	0.0042	0.00012	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,4,6,7,8-HpCDF	0.0032	J q B	0.0042	0.000069	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,4,7,8,9-HpCDF	0.00030	J B	0.0042	0.000076	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,4,7,8-HxCDD	ND		0.0042	0.000023	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,4,7,8-HxCDF	0.00027	J	0.0042	0.000030	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,6,7,8-HxCDD	0.00075	J	0.0042	0.000023	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,6,7,8-HxCDF	0.00017	J	0.0042	0.000029	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,7,8,9-HxCDD	0.00054	J B	0.0042	0.000021	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,7,8,9-HxCDF	0.00012	J B	0.0042	0.000020	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,7,8-PeCDD	0.00011	J	0.0042	0.000026	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
1,2,3,7,8-PeCDF	0.00010	J	0.0042	0.000024	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
2,3,4,6,7,8-HxCDF	0.00010	J	0.0042	0.000022	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
2,3,4,7,8-PeCDF	0.000081	J	0.0042	0.000025	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
2,3,7,8-TCDD	ND		0.00085	0.000026	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
2,3,7,8-TCDF	0.00019	J q B	0.00085	0.000014	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
OCDD	0.18	B	0.0085	0.000084	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1
OCDF	0.018	B	0.0085	0.000033	ug/Kg	☼	09/05/18 15:15	09/11/18 03:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*60*		*23 - 140*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*53*		*28 - 143*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*59*		*26 - 138*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,4,7,8-HxCDD	*53*		*32 - 141*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,4,7,8-HxCDF	*55*		*26 - 152*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,6,7,8-HxCDD	*55*		*28 - 130*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,6,7,8-HxCDF	*55*		*26 - 123*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,7,8,9-HxCDF	*59*		*29 - 147*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,7,8-PeCDD	*55*		*25 - 181*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-1,2,3,7,8-PeCDF	*54*		*24 - 185*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-2,3,4,6,7,8-HxCDF	*58*		*28 - 136*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-2,3,4,7,8-PeCDF	*55*		*21 - 178*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-2,3,7,8-TCDF	*62*		*24 - 169*	*09/05/18 15:15*	*09/11/18 03:56*	*1*
13C-OCDD	*50*		*17 - 157*	*09/05/18 15:15*	*09/11/18 03:56*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*122*		*35 - 197*	*09/05/18 15:15*	*09/11/18 03:56*	*1*

Client Sample ID: PDI-SG-B487
Date Collected: 07/28/18 09:31
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-4
Matrix: Solid
Percent Solids: 55.6

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	0.014	B	0.0045	0.000072	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,4,6,7,8-HpCDF	0.0031	J q B	0.0045	0.000065	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,4,7,8,9-HpCDF	0.00028	J B	0.0045	0.000073	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,4,7,8-HxCDD	0.00034	J B	0.0045	0.000024	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,4,7,8-HxCDF	0.00029	J	0.0045	0.000033	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,6,7,8-HxCDD	0.00072	J	0.0045	0.000024	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,6,7,8-HxCDF	0.00019	J	0.0045	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,7,8,9-HxCDD	0.00071	J B	0.0045	0.000022	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,7,8,9-HxCDF	0.00019	J B	0.0045	0.000024	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,7,8-PeCDD	0.00014	J	0.0045	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
1,2,3,7,8-PeCDF	0.00012	J	0.0045	0.000029	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
2,3,4,6,7,8-HxCDF	0.00012	J	0.0045	0.000025	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
2,3,4,7,8-PeCDF	0.00012	J	0.0045	0.000032	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
2,3,7,8-TCDD	0.00010	J q	0.00091	0.000027	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
2,3,7,8-TCDF	0.00026	J B	0.00091	0.000020	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
OCDD	0.12	B	0.0091	0.000059	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1
OCDF	0.011	B	0.0091	0.000027	ug/Kg	☼	09/05/18 15:15	09/11/18 04:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*67*		*23 - 140*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*57*		*28 - 143*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*65*		*26 - 138*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,4,7,8-HxCDD	*59*		*32 - 141*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,4,7,8-HxCDF	*59*		*26 - 152*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,6,7,8-HxCDD	*57*		*28 - 130*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,6,7,8-HxCDF	*60*		*26 - 123*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,7,8,9-HxCDF	*63*		*29 - 147*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,7,8-PeCDD	*59*		*25 - 181*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-1,2,3,7,8-PeCDF	*57*		*24 - 185*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-2,3,4,6,7,8-HxCDF	*62*		*28 - 136*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-2,3,4,7,8-PeCDF	*59*		*21 - 178*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-2,3,7,8-TCDD	*65*		*25 - 164*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-2,3,7,8-TCDF	*64*		*24 - 169*	*09/05/18 15:15*	*09/11/18 04:42*	*1*
13C-OCDD	*58*		*17 - 157*	*09/05/18 15:15*	*09/11/18 04:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*123*		*35 - 197*	*09/05/18 15:15*	*09/11/18 04:42*	*1*

Client Sample ID: PDI-SG-B488
Date Collected: 07/28/18 10:32
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-5
Matrix: Solid
Percent Solids: 61.1

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	0.014	B	0.0040	0.00014	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,4,6,7,8-HpCDF	0.0030	J q B	0.0040	0.00011	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,4,7,8,9-HpCDF	0.00030	J B	0.0040	0.00012	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,4,7,8-HxCDD	0.00035	J q B	0.0040	0.000060	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,4,7,8-HxCDF	0.00028	J q	0.0040	0.000072	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,6,7,8-HxCDD	0.00081	J q	0.0040	0.000057	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,6,7,8-HxCDF	0.00022	J	0.0040	0.000067	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,7,8,9-HxCDD	0.00089	J B	0.0040	0.000052	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,7,8,9-HxCDF	0.00029	J q B	0.0040	0.000052	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,7,8-PeCDD	ND		0.0040	0.000087	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
1,2,3,7,8-PeCDF	ND		0.0040	0.000066	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
2,3,4,6,7,8-HxCDF	0.00016	J	0.0040	0.000055	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
2,3,4,7,8-PeCDF	0.00014	J	0.0040	0.000072	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
2,3,7,8-TCDD	0.00026	J q	0.00080	0.000056	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
2,3,7,8-TCDF	0.00030	J q B	0.00080	0.000050	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
OCDD	0.13	B	0.0080	0.00037	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1
OCDF	0.010	B	0.0080	0.00011	ug/Kg	☼	09/05/18 15:15	09/12/18 12:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*59*		*23 - 140*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*28 - 143*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*62*		*26 - 138*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,4,7,8-HxCDD	*58*		*32 - 141*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,4,7,8-HxCDF	*58*		*26 - 152*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,6,7,8-HxCDD	*51*		*28 - 130*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,6,7,8-HxCDF	*56*		*26 - 123*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,7,8,9-HxCDF	*62*		*29 - 147*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,7,8-PeCDD	*58*		*25 - 181*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-1,2,3,7,8-PeCDF	*60*		*24 - 185*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-2,3,4,6,7,8-HxCDF	*60*		*28 - 136*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-2,3,4,7,8-PeCDF	*62*		*21 - 178*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-2,3,7,8-TCDF	*71*		*24 - 169*	*09/05/18 15:15*	*09/12/18 12:26*	*1*
13C-OCDD	*60*		*17 - 157*	*09/05/18 15:15*	*09/12/18 12:26*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*09/05/18 15:15*	*09/12/18 12:26*	*1*

Client Sample ID: PDI-SG-B486
Date Collected: 07/28/18 11:29
Date Received: 07/30/18 13:40

Lab Sample ID: 580-79202-6
Matrix: Solid
Percent Solids: 52.6

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	0.028	B	0.0047	0.00025	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,4,6,7,8-HpCDF	0.0067	B q	0.0047	0.00015	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,4,7,8,9-HpCDF	0.00057	J B	0.0047	0.00017	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,4,7,8-HxCDD	0.00063	J B q	0.0047	0.000077	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,4,7,8-HxCDF	0.00075	J	0.0047	0.000059	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,6,7,8-HxCDD	0.0017	J	0.0047	0.000080	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,6,7,8-HxCDF	0.00032	J q	0.0047	0.000054	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,7,8,9-HxCDD	0.0012	J B	0.0047	0.000070	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,7,8,9-HxCDF	ND		0.0047	0.000043	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,7,8-PeCDD	0.00017	J	0.0047	0.000089	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
1,2,3,7,8-PeCDF	ND		0.0047	0.000065	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
2,3,4,6,7,8-HxCDF	0.00016	J q	0.0047	0.000045	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
2,3,4,7,8-PeCDF	0.00023	J	0.0047	0.000069	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
2,3,7,8-TCDD	0.00012	J q	0.00095	0.000052	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
2,3,7,8-TCDF	0.00041	J B	0.00095	0.000047	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
OCDD	0.27	B	0.0095	0.00067	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1
OCDF	0.024	B	0.0095	0.00010	ug/Kg	☼	09/05/18 15:15	09/12/18 13:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*73*		*23 - 140*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*62*		*28 - 143*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*75*		*26 - 138*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,4,7,8-HxCDD	*65*		*32 - 141*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,4,7,8-HxCDF	*67*		*26 - 152*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,6,7,8-HxCDD	*60*		*28 - 130*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,6,7,8-HxCDF	*64*		*26 - 123*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,7,8,9-HxCDF	*71*		*29 - 147*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,7,8-PeCDD	*63*		*25 - 181*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-2,3,4,6,7,8-HxCDF	*69*		*28 - 136*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-2,3,7,8-TCDD	*67*		*25 - 164*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-2,3,7,8-TCDF	*75*		*24 - 169*	*09/05/18 15:15*	*09/12/18 13:10*	*1*
13C-OCDD	*80*		*17 - 157*	*09/05/18 15:15*	*09/12/18 13:10*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*114*		*35 - 197*	*09/05/18 15:15*	*09/12/18 13:10*	*1*

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

Lab Sample ID: MB 320-243983/1-A
Matrix: Solid
Analysis Batch: 244812

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 243983

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000181	J	0.0050	0.000014	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,4,6,7,8-HpCDF	0.000199	J q	0.0050	0.000018	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,4,7,8,9-HpCDF	0.000196	J q	0.0050	0.000021	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,4,7,8-HxCDD	0.000160	J	0.0050	0.000021	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000025	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000020	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000023	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,7,8,9-HxCDD	0.000112	J	0.0050	0.000019	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,7,8,9-HxCDF	0.000111	J	0.0050	0.000017	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000029	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000026	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000018	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000029	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
2,3,7,8-TCDD	ND		0.0010	0.000032	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
2,3,7,8-TCDF	0.000130	J	0.0010	0.000019	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
OCDD	0.000517	J	0.010	0.000017	ug/Kg		09/05/18 15:15	09/10/18 23:20	1
OCDF	0.000113	J q	0.010	0.000025	ug/Kg		09/05/18 15:15	09/10/18 23:20	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*87*		*23 - 140*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*79*		*28 - 143*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*84*		*26 - 138*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,4,7,8-HxCDD	*71*		*32 - 141*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,4,7,8-HxCDF	*75*		*26 - 152*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,6,7,8-HxCDD	*75*		*28 - 130*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,6,7,8-HxCDF	*78*		*26 - 123*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,7,8,9-HxCDF	*78*		*29 - 147*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*25 - 181*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-1,2,3,7,8-PeCDF	*69*		*24 - 185*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-2,3,4,6,7,8-HxCDF	*79*		*28 - 136*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-2,3,4,7,8-PeCDF	*67*		*21 - 178*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-2,3,7,8-TCDD	*75*		*25 - 164*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-2,3,7,8-TCDF	*72*		*24 - 169*	*09/05/18 15:15*	*09/10/18 23:20*	*1*
13C-OCDD	*79*		*17 - 157*	*09/05/18 15:15*	*09/10/18 23:20*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*124*		*35 - 197*	*09/05/18 15:15*	*09/10/18 23:20*	*1*

Lab Sample ID: LCS 320-243983/2-A
Matrix: Solid
Analysis Batch: 244812

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 243983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.0972		ug/Kg		97	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.104		ug/Kg		104	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.106		ug/Kg		106	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.108		ug/Kg		108	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134

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

Lab Sample ID: LCS 320-243983/2-A
Matrix: Solid
Analysis Batch: 244812

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 243983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.102		ug/Kg		102	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.106		ug/Kg		106	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.110		ug/Kg		110	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.106		ug/Kg		106	78 - 130
1,2,3,7,8-PeCDD	0.100	0.100		ug/Kg		100	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	0.107		ug/Kg		107	70 - 156
2,3,4,7,8-PeCDF	0.100	0.104		ug/Kg		104	68 - 160
2,3,7,8-TCDD	0.0200	0.0186		ug/Kg		93	67 - 158
2,3,7,8-TCDF	0.0200	0.0209		ug/Kg		104	75 - 158
OCDD	0.200	0.196		ug/Kg		98	78 - 144
OCDF	0.200	0.222		ug/Kg		111	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	*75*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*79*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*66*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*73*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*72*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*74*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*75*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*67*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*66*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*74*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*64*		*13 - 328*
13C-2,3,7,8-TCDD	*71*		*20 - 175*
13C-2,3,7,8-TCDF	*68*		*22 - 152*
13C-OCDD	*76*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*121*		*31 - 191*

Lab Sample ID: LCSD 320-243983/3-A
Matrix: Solid
Analysis Batch: 244812

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 243983

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	0.0997		ug/Kg		100	70 - 140	3	50
1,2,3,4,6,7,8-HpCDF	0.100	0.111		ug/Kg		111	82 - 122	6	50
1,2,3,4,7,8,9-HpCDF	0.100	0.111		ug/Kg		111	78 - 138	4	50
1,2,3,4,7,8-HxCDD	0.100	0.110		ug/Kg		110	70 - 164	1	50
1,2,3,4,7,8-HxCDF	0.100	0.110		ug/Kg		110	72 - 134	5	50
1,2,3,6,7,8-HxCDD	0.100	0.109		ug/Kg		109	76 - 134	6	50
1,2,3,6,7,8-HxCDF	0.100	0.113		ug/Kg		113	84 - 130	6	50
1,2,3,7,8,9-HxCDD	0.100	0.119		ug/Kg		119	64 - 162	8	50
1,2,3,7,8,9-HxCDF	0.100	0.112		ug/Kg		112	78 - 130	5	50
1,2,3,7,8-PeCDD	0.100	0.105		ug/Kg		105	70 - 142	4	50

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

Lab Sample ID: LCSD 320-243983/3-A
Matrix: Solid
Analysis Batch: 244812

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 243983

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.109		ug/Kg		109	80 - 134	5	50
2,3,4,6,7,8-HxCDF			0.100	0.111		ug/Kg		111	70 - 156	4	50
2,3,4,7,8-PeCDF			0.100	0.110		ug/Kg		110	68 - 160	5	50
2,3,7,8-TCDD			0.0200	0.0193		ug/Kg		97	67 - 158	4	50
2,3,7,8-TCDF			0.0200	0.0218		ug/Kg		109	75 - 158	4	50
OCDD			0.200	0.204		ug/Kg		102	78 - 144	4	50
OCDF			0.200	0.233		ug/Kg		117	63 - 170	5	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*85*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*74*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*82*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*66*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*70*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*71*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*74*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*76*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*67*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*66*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*77*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*62*		*13 - 328*
13C-2,3,7,8-TCDD	*73*		*20 - 175*
13C-2,3,7,8-TCDF	*68*		*22 - 152*
13C-OCDD	*77*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*123*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-79202-2

Client Sample ID: PDI-SG-B485
Lab Sample ID: 580-79202-1
Date Collected: 07/27/18 12:45
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 54.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244812	09/11/18 02:24	AS	TAL SAC

Client Sample ID: PDI-SG-B484
Lab Sample ID: 580-79202-2
Date Collected: 07/27/18 15:15
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 54.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244812	09/11/18 03:10	AS	TAL SAC

Client Sample ID: PDI-SG-B482
Lab Sample ID: 580-79202-3
Date Collected: 07/27/18 14:18
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 59.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244812	09/11/18 03:56	AS	TAL SAC

Client Sample ID: PDI-SG-B487
Lab Sample ID: 580-79202-4
Date Collected: 07/28/18 09:31
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 55.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244812	09/11/18 04:42	AS	TAL SAC

Client Sample ID: PDI-SG-B488
Lab Sample ID: 580-79202-5
Date Collected: 07/28/18 10:32
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 61.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	245303	09/12/18 12:26	ALM	TAL SAC

Client Sample ID: PDI-SG-B486
Lab Sample ID: 580-79202-6
Date Collected: 07/28/18 11:29
Matrix: Solid
Date Received: 07/30/18 13:40
Percent Solids: 52.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243983	09/05/18 15:15	SR1	TAL SAC
Total/NA	Analysis	1613B		1	245303	09/12/18 13:10	ALM	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-79202-2

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: 580-79202-2
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
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
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	10-31-18
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	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: 580-79202-2

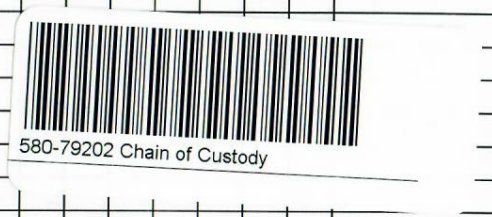
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79202-1	PDI-SG-B485	Solid	07/27/18 12:45	07/30/18 13:40
580-79202-2	PDI-SG-B484	Solid	07/27/18 15:15	07/30/18 13:40
580-79202-3	PDI-SG-B482	Solid	07/27/18 14:18	07/30/18 13:40
580-79202-4	PDI-SG-B487	Solid	07/28/18 09:31	07/30/18 13:40
580-79202-5	PDI-SG-B488	Solid	07/28/18 10:32	07/30/18 13:40
580-79202-6	PDI-SG-B486	Solid	07/28/18 11:29	07/30/18 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** **Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ ☐ 21 days ☒ Other _ASAP_____	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**7/30/2018** **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
Sample Type: D/U

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kron/Unger	ATTA BSEE	Sample Specific Notes:
PDI-SG-B485	7/27/2018	12:45	SS		LS	8		H	H	H	x	H	H	H	H	
PDI-SG-B484	7/27/2018	15:15	SS		MM	7		H	H	H	x	H	H	H		
PDI-SG-B482	7/27/2018	14:18	SS		MM	7		H	H	H	x	H	H	H	H	
PDI-SG-B487	7/28/2018	9:31	SS		MT	8		H	H	H	x	H	H	H	H	
PDI-SG-B488	7/28/2018	10:32	SS		MT	8		H	H	H	x	H	H	H	H	
PDI-SG-B486	7/28/2018	11:29	SS		MT	8		H	H	H	x	H	H	H	H	



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 ☒ Disposal By Lab ☒ Archive For 12 Months

Special Instructions/QC Requirements & Comments:
Analyze samples for grain size ASAP, Hold (H) remaining analyses pending further instruction.
Separate reports for each lab.

Relinquished by:	Company: AECOM	Date/Time: 7/30/18/1305	Received by:	Company: M.E	Date/Time: 7-30-18 /1305
Relinquished by:	Company: M.E	Date/Time: 7-30-18 / 1340	Received by:	Company: TAPOR	Date/Time: 7/30/18 1340
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

3.8

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) _____ ☐ 21 days ☒ Other _ASAP_____	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**7/30/2018** COC No: 1 **Carrier: Courier** 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**
Sample Type: D/U

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kron/Unger	ATTACHED	Sample Specific Notes:
PDI-SG-B485	7/27/2018	12:45	SS		LS	8		H	H	H	x	H	H	H	H	
PDI-SG-B484	7/27/2018	15:15	SS		MM	7		H	H	H	x	H	H	H		
PDI-SG-B482	7/27/2018	14:18	SS		MM	~~8~~ 7		H	H	H	x	H	H	H	H	
PDI-SG-B487	7/28/2018	9:31	SS		MT	8		H	H	H	x	H	H	H	H	
PDI-SG-B488	7/28/2018	10:32	SS		MT	8		H	H	H	x	H	H	H	H	
PDI-SG-B486	7/28/2018	11:29	SS		MT	8		H	H	H	x	H	H	H	H	

580-79202 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 ☒ Disposal By Lab ☒ Archive For 12 Months

Special Instructions/QC Requirements & Comments:
Analyze samples for grain size ASAP, Hold (H) remaining analyses pending further instruction.
Separate reports for each lab.

Relinquished by:	Company: AECOM	Date/Time: 7/30/18 1305	Received by:	Company: M.E	Date/Time: 7-30-18 1305
Relinquished by:	Company: M.E	Date/Time: 7-30-18 1340	Received by:	Company: TAPOR	Date/Time: 7/30/18 1340
Relinquished by:	Company: TAPOR	Date/Time: 7/30/18 1700	Received by:	Company: SRH TA	Date/Time: 7/31/18 0930

3.8

IKS = 1.4/1.4 w/c.s.

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: 580-57551.1
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 #: 580-79202-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 8/15/2018			
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#:			

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:

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	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
PDI-SG-B485 (580-79202-1)	7/27/18	12:45 Pacific		Solid			X	X	2	
PDI-SG-B484 (580-79202-2)	7/27/18	15:15 Pacific		Solid			X	X	2	
PDI-SG-B482 (580-79202-3)	7/27/18	14:18 Pacific		Solid			X	X	2	
PDI-SG-B487 (580-79202-4)	7/28/18	09:31 Pacific		Solid			X	X	2	
PDI-SG-B488 (580-79202-5)	7/28/18	10:32 Pacific		Solid			X	X	2	
PDI-SG-B486 (580-79202-6)	7/28/18	11:29 Pacific		Solid			X	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:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	7/30/18 1700	TAPDR	[signature]	7/31/18 900	TASac
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: ☒ Yes △ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.7

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79202-2

Login Number: 79202
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	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

580-79202 Field Sheet

Job: ___

Tracking # 4423 0750 7811 SO / PO / FO / 2-Day / Ground / UPS / Courier / 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: _____

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: —

Temp: Observed 3.7

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: 7/31/18

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

WF1K @ 11:25

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79202-2

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)
580-79202-1	PDI-SG-B485	63	52	62	55	59	58	60	62
580-79202-2	PDI-SG-B484	51	41	52	47	48	48	49	55
580-79202-3	PDI-SG-B482	60	53	59	53	55	55	55	59
580-79202-4	PDI-SG-B487	67	57	65	59	59	57	60	63
580-79202-5	PDI-SG-B488	59	49	62	58	58	51	56	62
580-79202-6	PDI-SG-B486	73	62	75	65	67	60	64	71
MB 320-243983/1-A	Method Blank	87	79	84	71	75	75	78	78

		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)
580-79202-1	PDI-SG-B485	57	55	62	57	63	62	53
580-79202-2	PDI-SG-B484	51	51	52	52	60	62	39
580-79202-3	PDI-SG-B482	55	54	58	55	63	62	50
580-79202-4	PDI-SG-B487	59	57	62	59	65	64	58
580-79202-5	PDI-SG-B488	58	60	60	62	63	71	60
580-79202-6	PDI-SG-B486	63	65	69	66	67	75	80
MB 320-243983/1-A	Method Blank	71	69	79	67	75	72	79

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 320-243983/2-A	Lab Control Sample	84	75	79	66	73	72	74	75
LCSD 320-243983/3-A	Lab Control Sample Dup	85	74	82	66	70	71	74	76

		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 320-243983/2-A	Lab Control Sample	67	66	74	64	71	68	76
LCSD 320-243983/3-A	Lab Control Sample Dup	67	66	77	62	73	68	77

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79202-2

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