TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77000-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Karen Mixon

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Authorized for release by:
5/30/2018 12:00:52 PM

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Job ID: 580-77000-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-77000-2

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

Twelve samples were received on 5/2/2018 1:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.3º C and 2.3º 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-S211 (580-77000-1), PDI-SG-S213 (580-77000-2), PDI-SG-S220 (580-77000-3), PDI-SG-S215 (580-77000-4), PDI-SG-S241 (580-77000-5), PDI-SG-S235 (580-77000-6), PDI-SG-S238 (580-77000-7), PDI-SG-S223 (580-77000-8), PDI-SG-S225 (580-77000-9), PDI-SG-S231 (580-77000-10), PDI-SG-S230 (580-77000-11) and PDI-SG-S234 (580-77000-12) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 05/11/2018 and analyzed on 05/18/2018, 05/19/2018 and 05/20/2018.

Several analytes were detected in method blank MB 320-222717/1-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 following samples exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): PDI-SG-S215 (580-77000-4). The reporting limit (RL) for the affected analytes has been raised to be equal to the EDL, and a "G" qualifier applied.

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: PDI-SG-S211 (580-77000-1), PDI-SG-S213 (580-77000-2), PDI-SG-S215 (580-77000-4), PDI-SG-S225 (580-77000-9) and PDI-SG-S231 (580-77000-10). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

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 associated with the following samples run on instrument 11D2

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Laboratory: TestAmerica Seattle (Continued)

exceeded this criteria: PDI-SG-S211 (580-77000-1), PDI-SG-S213 (580-77000-2), PDI-SG-S220 (580-77000-3), PDI-SG-S215 (580-77000-4), PDI-SG-S241 (580-77000-5), PDI-SG-S235 (580-77000-6), PDI-SG-S238 (580-77000-7), PDI-SG-S223 (580-77000-8), PDI-SG-S225 (580-77000-9), PDI-SG-S231 (580-77000-10), PDI-SG-S230 (580-77000-11), PDI-SG-S234 (580-77000-12), (CCV 320-224541/3), and (CCV 320-224534/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-S211 (580-77000-1), PDI-SG-S213 (580-77000-2), PDI-SG-S220 (580-77000-3), PDI-SG-S215 (580-77000-4), PDI-SG-S241 (580-77000-5), PDI-SG-S235 (580-77000-6), PDI-SG-S238 (580-77000-7), PDI-SG-S223 (580-77000-8), PDI-SG-S225 (580-77000-9), PDI-SG-S231 (580-77000-10), PDI-SG-S230 (580-77000-11) and PDI-SG-S234 (580-77000-12). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-222717.

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: 580-77000-2

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.
*	Isotope Dilution analyte is outside acceptance limits.
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix 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-S211
Date Collected: 04/30/18 14:05
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-1
Matrix: Solid
Percent Solids: 31.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**0.00071**	**J q**	0.0016	0.00020	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,7,8-PeCDD	ND		0.0080	0.00040	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,7,8-PeCDF	**0.0015**	**J B q**	0.0080	0.00037	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
2,3,4,7,8-PeCDF	**0.0043**	**J**	0.0080	0.00039	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,4,7,8-HxCDD	**0.0044**	**J B**	0.0080	0.00038	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,6,7,8-HxCDD	**0.022**		0.0080	0.00039	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,7,8,9-HxCDD	**0.0075**	**J**	0.0080	0.00034	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,4,7,8-HxCDF	**0.025**		0.0080	0.0011	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,6,7,8-HxCDF	**0.0066**	**J**	0.0080	0.0010	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,7,8,9-HxCDF	ND		0.0080	0.00069	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
2,3,4,6,7,8-HxCDF	**0.0034**	**J**	0.0080	0.00077	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,4,6,7,8-HpCDD	**0.73**	**B**	0.0080	0.0050	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,4,6,7,8-HpCDF	**0.19**		0.0080	0.0039	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
1,2,3,4,7,8,9-HpCDF	**0.012**	**B**	0.0080	0.0038	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
OCDD	**5.5**	**B**	0.016	0.0031	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1
OCDF	**0.67**		0.016	0.00069	ug/Kg	☼	05/11/18 11:03	05/18/18 12:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*58*		*25 - 164*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,7,8-PeCDD	*55*		*25 - 181*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,7,8-PeCDF	*56*		*24 - 185*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-2,3,4,7,8-PeCDF	*59*		*21 - 178*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,4,7,8-HxCDD	*51*		*32 - 141*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,6,7,8-HxCDD	*45*		*28 - 130*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,4,7,8-HxCDF	*50*		*26 - 152*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,6,7,8-HxCDF	*47*		*26 - 123*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-2,3,4,6,7,8-HxCDF	*50*		*28 - 136*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,7,8,9-HxCDF	*52*		*29 - 147*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*32*		*23 - 140*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*24*	*	*28 - 143*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*34*		*26 - 138*	*05/11/18 11:03*	*05/18/18 12:32*	*1*
13C-OCDD	*28*		*17 - 157*	*05/11/18 11:03*	*05/18/18 12:32*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*100*		*35 - 197*	*05/11/18 11:03*	*05/18/18 12:32*	*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	**0.0019**		0.0016	0.00011	ug/Kg	☼	05/11/18 11:03	05/19/18 04:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*05/11/18 11:03*	*05/19/18 04:40*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*90*		*35 - 197*	*05/11/18 11:03*	*05/19/18 04:40*	*1*

Client Sample ID: PDI-SG-S213
Date Collected: 04/30/18 15:05
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-2
Matrix: Solid
Percent Solids: 30.0

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00058	J q	0.0017	0.00022	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,7,8-PeCDD	0.0020	J	0.0083	0.00038	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,7,8-PeCDF	0.0021	J B	0.0083	0.00035	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
2,3,4,7,8-PeCDF	0.0034	J	0.0083	0.00037	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,4,7,8-HxCDD	0.0041	J B	0.0083	0.00028	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,6,7,8-HxCDD	0.019		0.0083	0.00028	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,7,8,9-HxCDD	0.0061	J	0.0083	0.00025	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,4,7,8-HxCDF	0.020	q	0.0083	0.00089	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,6,7,8-HxCDF	0.0061	J	0.0083	0.00087	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,7,8,9-HxCDF	0.00061	J B	0.0083	0.00055	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
2,3,4,6,7,8-HxCDF	0.0029	J	0.0083	0.00063	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,4,6,7,8-HpCDD	0.59	B	0.0083	0.0045	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,4,6,7,8-HpCDF	0.16		0.0083	0.0034	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
1,2,3,4,7,8,9-HpCDF	0.011	B	0.0083	0.0035	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
OCDD	4.8	B	0.017	0.0030	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1
OCDF	0.52		0.017	0.00054	ug/Kg	☼	05/11/18 11:03	05/18/18 13:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-2,3,7,8-TCDF	*67*		*24 - 169*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,7,8-PeCDD	*58*		*25 - 181*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,7,8-PeCDF	*60*		*24 - 185*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-2,3,4,7,8-PeCDF	*63*		*21 - 178*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,4,7,8-HxCDD	*53*		*32 - 141*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,4,7,8-HxCDF	*53*		*26 - 152*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,6,7,8-HxCDF	*49*		*26 - 123*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-2,3,4,6,7,8-HxCDF	*53*		*28 - 136*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,7,8,9-HxCDF	*56*		*29 - 147*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*38*		*23 - 140*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*27*	*	*28 - 143*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*39*		*26 - 138*	*05/11/18 11:03*	*05/18/18 13:20*	*1*
13C-OCDD	*35*		*17 - 157*	*05/11/18 11:03*	*05/18/18 13:20*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*05/11/18 11:03*	*05/18/18 13:20*	*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	0.0019		0.0017	0.000093	ug/Kg	☼	05/11/18 11:03	05/19/18 05:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*67*		*24 - 169*	*05/11/18 11:03*	*05/19/18 05:18*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*97*		*35 - 197*	*05/11/18 11:03*	*05/19/18 05:18*	*1*

Client Sample ID: PDI-SG-S220
Date Collected: 04/30/18 16:20
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-3
Matrix: Solid
Percent Solids: 34.0

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00046	J q	0.0015	0.00022	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,7,8-PeCDD	0.0019	J	0.0074	0.00030	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,7,8-PeCDF	0.0014	J B	0.0074	0.00024	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
2,3,4,7,8-PeCDF	0.0025	J	0.0074	0.00026	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,4,7,8-HxCDD	0.0035	J B	0.0074	0.00021	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,6,7,8-HxCDD	0.013		0.0074	0.00021	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,7,8,9-HxCDD	0.0056	J q	0.0074	0.00019	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,4,7,8-HxCDF	0.0090		0.0074	0.00053	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,6,7,8-HxCDF	0.0033	J	0.0074	0.00049	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,7,8,9-HxCDF	ND		0.0074	0.00034	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
2,3,4,6,7,8-HxCDF	0.0018	J	0.0074	0.00036	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,4,6,7,8-HpCDD	0.36	B	0.0074	0.0031	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,4,6,7,8-HpCDF	0.064	q	0.0074	0.0016	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
1,2,3,4,7,8,9-HpCDF	0.0049	J B	0.0074	0.0017	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
OCDD	2.6	B	0.015	0.0014	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1
OCDF	0.20		0.015	0.00033	ug/Kg	☼	05/11/18 11:03	05/18/18 14:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-2,3,7,8-TCDF	*68*		*24 - 169*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,7,8-PeCDD	*65*		*25 - 181*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,7,8-PeCDF	*66*		*24 - 185*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,4,7,8-HxCDD	*61*		*32 - 141*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,4,7,8-HxCDF	*61*		*26 - 152*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,6,7,8-HxCDF	*59*		*26 - 123*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-2,3,4,6,7,8-HxCDF	*64*		*28 - 136*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,7,8,9-HxCDF	*63*		*29 - 147*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*47*		*23 - 140*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*36*		*28 - 143*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*46*		*26 - 138*	*05/11/18 11:03*	*05/18/18 14:09*	*1*
13C-OCDD	*49*		*17 - 157*	*05/11/18 11:03*	*05/18/18 14:09*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*109*		*35 - 197*	*05/11/18 11:03*	*05/18/18 14:09*	*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	0.0019		0.0015	0.000090	ug/Kg	☼	05/11/18 11:03	05/19/18 05:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*05/11/18 11:03*	*05/19/18 05:56*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*96*		*35 - 197*	*05/11/18 11:03*	*05/19/18 05:56*	*1*

Client Sample ID: PDI-SG-S215
Date Collected: 04/30/18 17:42
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-4
Matrix: Solid
Percent Solids: 28.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00056	J q	0.0018	0.00026	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,7,8-PeCDD	0.0026	J	0.0088	0.00064	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,7,8-PeCDF	0.0022	J q B	0.0088	0.00067	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
2,3,4,7,8-PeCDF	0.0057	J	0.0088	0.00065	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,4,7,8-HxCDD	0.0045	J B	0.0088	0.00058	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,6,7,8-HxCDD	0.022		0.0088	0.00054	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,7,8,9-HxCDD	0.0070	J q	0.0088	0.00050	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,4,7,8-HxCDF	0.034		0.0088	0.0017	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,6,7,8-HxCDF	0.0098		0.0088	0.0015	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,7,8,9-HxCDF	ND		0.0088	0.0010	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
2,3,4,6,7,8-HxCDF	0.0038	J	0.0088	0.0011	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,4,6,7,8-HpCDD	0.72	G B	0.014	0.014	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,4,6,7,8-HpCDF	0.19	G	0.0095	0.0095	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
1,2,3,4,7,8,9-HpCDF	0.012	G B	0.0090	0.0090	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
OCDD	5.6	B	0.018	0.0056	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1
OCDF	0.61		0.018	0.0011	ug/Kg	☼	05/11/18 11:03	05/18/18 21:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*56*		*25 - 164*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-2,3,7,8-TCDF	*65*		*24 - 169*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,7,8-PeCDD	*51*		*25 - 181*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,7,8-PeCDF	*52*		*24 - 185*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-2,3,4,7,8-PeCDF	*57*		*21 - 178*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,4,7,8-HxCDD	*42*		*32 - 141*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,6,7,8-HxCDD	*44*		*28 - 130*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,4,7,8-HxCDF	*43*		*26 - 152*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,6,7,8-HxCDF	*42*		*26 - 123*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-2,3,4,6,7,8-HxCDF	*47*		*28 - 136*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,7,8,9-HxCDF	*48*		*29 - 147*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*28*		*23 - 140*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*20*	*	*28 - 143*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*30*		*26 - 138*	*05/11/18 11:03*	*05/18/18 21:06*	*1*
13C-OCDD	*22*		*17 - 157*	*05/11/18 11:03*	*05/18/18 21:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*05/11/18 11:03*	*05/18/18 21:06*	*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	0.0022		0.0018	0.000085	ug/Kg	☼	05/11/18 11:03	05/19/18 06:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*65*		*24 - 169*	*05/11/18 11:03*	*05/19/18 06:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*92*		*35 - 197*	*05/11/18 11:03*	*05/19/18 06:34*	*1*

Client Sample ID: PDI-SG-S241
Date Collected: 05/01/18 16:50
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-5
Matrix: Solid
Percent Solids: 38.5

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00078	J q	0.0013	0.00020	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,7,8-PeCDD	0.0019	J	0.0064	0.00030	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,7,8-PeCDF	0.0014	J B	0.0064	0.00026	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
2,3,4,7,8-PeCDF	0.0021	J	0.0064	0.00028	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,4,7,8-HxCDD	0.0033	J B	0.0064	0.00041	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,6,7,8-HxCDD	0.013		0.0064	0.00038	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,7,8,9-HxCDD	0.0064		0.0064	0.00036	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,4,7,8-HxCDF	0.0056	J	0.0064	0.00057	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,6,7,8-HxCDF	0.0036	J	0.0064	0.00050	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,7,8,9-HxCDF	ND		0.0064	0.00037	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
2,3,4,6,7,8-HxCDF	0.0016	J	0.0064	0.00038	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,4,6,7,8-HpCDD	0.29	B	0.0064	0.0046	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,4,6,7,8-HpCDF	0.050		0.0064	0.0017	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
1,2,3,4,7,8,9-HpCDF	0.0034	J B	0.0064	0.0020	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
OCDD	2.4	B	0.013	0.0022	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1
OCDF	0.14		0.013	0.00030	ug/Kg	☼	05/11/18 11:03	05/18/18 21:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-2,3,7,8-TCDF	*64*		*24 - 169*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,7,8-PeCDD	*61*		*25 - 181*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,7,8-PeCDF	*60*		*24 - 185*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-2,3,4,7,8-PeCDF	*60*		*21 - 178*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,4,7,8-HxCDD	*57*		*32 - 141*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,4,7,8-HxCDF	*57*		*26 - 152*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-2,3,4,6,7,8-HxCDF	*60*		*28 - 136*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,7,8,9-HxCDF	*60*		*29 - 147*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*46*		*23 - 140*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*37*		*28 - 143*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*43*		*26 - 138*	*05/11/18 11:03*	*05/18/18 21:55*	*1*
13C-OCDD	*46*		*17 - 157*	*05/11/18 11:03*	*05/18/18 21:55*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*05/11/18 11:03*	*05/18/18 21:55*	*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	0.0027		0.0013	0.000065	ug/Kg	☼	05/11/18 11:03	05/19/18 07:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*61*		*24 - 169*	*05/11/18 11:03*	*05/19/18 07:11*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*92*		*35 - 197*	*05/11/18 11:03*	*05/19/18 07:11*	*1*

Client Sample ID: PDI-SG-S235
Date Collected: 05/01/18 17:35
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-6
Matrix: Solid
Percent Solids: 31.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00072	J q	0.0016	0.00018	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,7,8-PeCDD	0.0030	J	0.0079	0.00034	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,7,8-PeCDF	0.0024	J B	0.0079	0.00036	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
2,3,4,7,8-PeCDF	0.0029	J	0.0079	0.00038	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,4,7,8-HxCDD	0.0056	J B	0.0079	0.00040	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,6,7,8-HxCDD	0.019		0.0079	0.00037	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,7,8,9-HxCDD	0.0098		0.0079	0.00035	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,4,7,8-HxCDF	0.010		0.0079	0.00061	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,6,7,8-HxCDF	0.0052	J	0.0079	0.00055	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,7,8,9-HxCDF	0.00064	J B	0.0079	0.00040	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
2,3,4,6,7,8-HxCDF	0.0029	J	0.0079	0.00041	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,4,6,7,8-HpCDD	0.53	B	0.0079	0.0060	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,4,6,7,8-HpCDF	0.097		0.0079	0.0025	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
1,2,3,4,7,8,9-HpCDF	0.0048	J q B	0.0079	0.0029	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
OCDD	4.1	B	0.016	0.0028	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1
OCDF	0.28		0.016	0.00040	ug/Kg	☼	05/11/18 11:03	05/18/18 22:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-2,3,7,8-TCDF	*70*		*24 - 169*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,7,8-PeCDD	*66*		*25 - 181*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,7,8-PeCDF	*66*		*24 - 185*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-2,3,4,7,8-PeCDF	*68*		*21 - 178*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,4,7,8-HxCDD	*62*		*32 - 141*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,6,7,8-HxCDD	*63*		*28 - 130*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,4,7,8-HxCDF	*62*		*26 - 152*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,6,7,8-HxCDF	*61*		*26 - 123*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-2,3,4,6,7,8-HxCDF	*63*		*28 - 136*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,7,8,9-HxCDF	*63*		*29 - 147*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*36*		*28 - 143*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*42*		*26 - 138*	*05/11/18 11:03*	*05/18/18 22:43*	*1*
13C-OCDD	*43*		*17 - 157*	*05/11/18 11:03*	*05/18/18 22:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*106*		*35 - 197*	*05/11/18 11:03*	*05/18/18 22:43*	*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	0.0027		0.0016	0.000067	ug/Kg	☼	05/11/18 11:03	05/19/18 07:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*67*		*24 - 169*	*05/11/18 11:03*	*05/19/18 07:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*94*		*35 - 197*	*05/11/18 11:03*	*05/19/18 07:49*	*1*

Client Sample ID: PDI-SG-S238
Date Collected: 05/01/18 16:10
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-7
Matrix: Solid
Percent Solids: 31.8

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00090	J q	0.0016	0.00020	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,7,8-PeCDD	0.0036	J	0.0078	0.00029	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,7,8-PeCDF	0.0018	J B	0.0078	0.00036	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
2,3,4,7,8-PeCDF	0.0032	J	0.0078	0.00037	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,4,7,8-HxCDD	0.0071	J B	0.0078	0.00035	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,6,7,8-HxCDD	0.025		0.0078	0.00034	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,7,8,9-HxCDD	0.013		0.0078	0.00031	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,4,7,8-HxCDF	0.012		0.0078	0.00063	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,6,7,8-HxCDF	0.0048	J	0.0078	0.00059	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,7,8,9-HxCDF	0.00061	J B	0.0078	0.00044	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
2,3,4,6,7,8-HxCDF	0.0028	J	0.0078	0.00045	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,4,6,7,8-HpCDD	0.71	B	0.0078	0.0064	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,4,6,7,8-HpCDF	0.10		0.0078	0.0024	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
1,2,3,4,7,8,9-HpCDF	0.0064	J B	0.0078	0.0026	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
OCDD	5.4	B	0.016	0.0030	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1
OCDF	0.29		0.016	0.00041	ug/Kg	☼	05/11/18 11:03	05/18/18 23:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-2,3,7,8-TCDF	*65*		*24 - 169*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,7,8-PeCDD	*66*		*25 - 181*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,4,7,8-HxCDD	*63*		*32 - 141*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*28 - 130*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,4,7,8-HxCDF	*61*		*26 - 152*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,6,7,8-HxCDF	*61*		*26 - 123*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-2,3,4,6,7,8-HxCDF	*63*		*28 - 136*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,7,8,9-HxCDF	*62*		*29 - 147*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*44*		*23 - 140*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*33*		*28 - 143*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*41*		*26 - 138*	*05/11/18 11:03*	*05/18/18 23:31*	*1*
13C-OCDD	*44*		*17 - 157*	*05/11/18 11:03*	*05/18/18 23:31*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*106*		*35 - 197*	*05/11/18 11:03*	*05/18/18 23:31*	*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	0.0029		0.0016	0.000080	ug/Kg	☼	05/11/18 11:03	05/19/18 08:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*05/11/18 11:03*	*05/19/18 08:27*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*97*		*35 - 197*	*05/11/18 11:03*	*05/19/18 08:27*	*1*

Client Sample ID: PDI-SG-S223
Date Collected: 05/01/18 11:00
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-8
Matrix: Solid
Percent Solids: 41.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00070	J q	0.0012	0.00012	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,7,8-PeCDD	0.0027	J	0.0060	0.00023	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,7,8-PeCDF	0.0036	J B	0.0060	0.00033	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
2,3,4,7,8-PeCDF	0.0056	J	0.0060	0.00037	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,4,7,8-HxCDD	0.0041	J B	0.0060	0.00035	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,6,7,8-HxCDD	0.019		0.0060	0.00031	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,7,8,9-HxCDD	0.0087		0.0060	0.00030	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,4,7,8-HxCDF	0.018		0.0060	0.00069	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,6,7,8-HxCDF	0.0096		0.0060	0.00061	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,7,8,9-HxCDF	0.00058	J q B	0.0060	0.00044	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
2,3,4,6,7,8-HxCDF	0.0079		0.0060	0.00050	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,4,6,7,8-HpCDD	0.42	B	0.0060	0.0030	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,4,6,7,8-HpCDF	0.11		0.0060	0.0022	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
1,2,3,4,7,8,9-HpCDF	0.010	B	0.0060	0.0029	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
OCDD	3.6	B	0.012	0.0017	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1
OCDF	0.27		0.012	0.00029	ug/Kg	☼	05/11/18 11:03	05/19/18 00:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-2,3,7,8-TCDF	*68*		*24 - 169*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,7,8-PeCDD	*67*		*25 - 181*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,7,8-PeCDF	*68*		*24 - 185*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,4,7,8-HxCDD	*63*		*32 - 141*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*28 - 130*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,4,7,8-HxCDF	*64*		*26 - 152*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,6,7,8-HxCDF	*63*		*26 - 123*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-2,3,4,6,7,8-HxCDF	*64*		*28 - 136*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,7,8,9-HxCDF	*64*		*29 - 147*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*48*		*23 - 140*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*37*		*28 - 143*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*40*		*26 - 138*	*05/11/18 11:03*	*05/19/18 00:20*	*1*
13C-OCDD	*48*		*17 - 157*	*05/11/18 11:03*	*05/19/18 00:20*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*112*		*35 - 197*	*05/11/18 11:03*	*05/19/18 00:20*	*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	0.0038		0.0012	0.000047	ug/Kg	☼	05/11/18 11:03	05/19/18 09:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*72*		*24 - 169*	*05/11/18 11:03*	*05/19/18 09:05*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*05/11/18 11:03*	*05/19/18 09:05*	*1*

Client Sample ID: PDI-SG-S225
Date Collected: 05/01/18 12:00
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-9
Matrix: Solid
Percent Solids: 33.9

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00058	J q	0.0015	0.00017	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,7,8-PeCDD	0.0022	J	0.0073	0.00021	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,7,8-PeCDF	0.0019	J B	0.0073	0.00031	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
2,3,4,7,8-PeCDF	0.0029	J	0.0073	0.00032	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,4,7,8-HxCDD	0.0045	J B	0.0073	0.00037	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,6,7,8-HxCDD	0.016		0.0073	0.00036	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,7,8,9-HxCDD	0.0067	J	0.0073	0.00033	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,4,7,8-HxCDF	0.0039	J q	0.0073	0.00071	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,6,7,8-HxCDF	0.0034	J q	0.0073	0.00068	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,7,8,9-HxCDF	0.00064	J B	0.0073	0.00045	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
2,3,4,6,7,8-HxCDF	0.0022	J	0.0073	0.00050	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,4,6,7,8-HpCDD	0.46	B	0.0073	0.0035	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,4,6,7,8-HpCDF	0.10		0.0073	0.0022	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
1,2,3,4,7,8,9-HpCDF	0.0060	J B	0.0073	0.0023	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
OCDD	3.8	B	0.015	0.0020	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1
OCDF	0.31		0.015	0.00057	ug/Kg	☼	05/11/18 11:03	05/19/18 01:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-2,3,7,8-TCDF	*65*		*24 - 169*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,7,8-PeCDD	*54*		*25 - 181*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,7,8-PeCDF	*55*		*24 - 185*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-2,3,4,7,8-PeCDF	*59*		*21 - 178*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,4,7,8-HxCDD	*46*		*32 - 141*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,6,7,8-HxCDD	*43*		*28 - 130*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,4,7,8-HxCDF	*48*		*26 - 152*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,6,7,8-HxCDF	*44*		*26 - 123*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-2,3,4,6,7,8-HxCDF	*48*		*28 - 136*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,7,8,9-HxCDF	*49*		*29 - 147*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*30*		*23 - 140*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*22*	*	*28 - 143*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*29*		*26 - 138*	*05/11/18 11:03*	*05/19/18 01:08*	*1*
13C-OCDD	*25*		*17 - 157*	*05/11/18 11:03*	*05/19/18 01:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*110*		*35 - 197*	*05/11/18 11:03*	*05/19/18 01:08*	*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	0.0026		0.0015	0.000066	ug/Kg	☼	05/11/18 11:03	05/19/18 09:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*05/11/18 11:03*	*05/19/18 09:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*97*		*35 - 197*	*05/11/18 11:03*	*05/19/18 09:43*	*1*

Client Sample ID: PDI-SG-S231
Date Collected: 05/01/18 13:50
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-10
Matrix: Solid
Percent Solids: 30.1

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00074	J	0.0017	0.00015	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,7,8-PeCDD	0.0023	J	0.0084	0.00031	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,7,8-PeCDF	0.0023	J B	0.0084	0.00035	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
2,3,4,7,8-PeCDF	0.0027	J	0.0084	0.00035	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,4,7,8-HxCDD	0.0046	J B	0.0084	0.00031	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,6,7,8-HxCDD	0.016		0.0084	0.00032	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,7,8,9-HxCDD	0.0077	J	0.0084	0.00028	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,4,7,8-HxCDF	0.0093		0.0084	0.00069	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,6,7,8-HxCDF	0.0038	J	0.0084	0.00065	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,7,8,9-HxCDF	0.00063	J q B	0.0084	0.00045	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
2,3,4,6,7,8-HxCDF	0.0022	J	0.0084	0.00049	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,4,6,7,8-HpCDD	0.45	B	0.0084	0.0037	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,4,6,7,8-HpCDF	0.085		0.0084	0.0021	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
1,2,3,4,7,8,9-HpCDF	0.0059	J B	0.0084	0.0024	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
OCDD	3.4	B	0.017	0.0019	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1
OCDF	0.23		0.017	0.00041	ug/Kg	☼	05/11/18 11:03	05/19/18 01:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*60*		*25 - 164*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-2,3,7,8-TCDF	*67*		*24 - 169*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,7,8-PeCDD	*58*		*25 - 181*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,7,8-PeCDF	*59*		*24 - 185*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-2,3,4,7,8-PeCDF	*63*		*21 - 178*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,4,7,8-HxCDD	*54*		*32 - 141*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,6,7,8-HxCDD	*51*		*28 - 130*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,4,7,8-HxCDF	*56*		*26 - 152*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,6,7,8-HxCDF	*53*		*26 - 123*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-2,3,4,6,7,8-HxCDF	*55*		*28 - 136*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,7,8,9-HxCDF	*56*		*29 - 147*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*37*		*23 - 140*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*27*	*	*28 - 143*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*35*		*26 - 138*	*05/11/18 11:03*	*05/19/18 01:57*	*1*
13C-OCDD	*34*		*17 - 157*	*05/11/18 11:03*	*05/19/18 01:57*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*107*		*35 - 197*	*05/11/18 11:03*	*05/19/18 01:57*	*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	0.0025		0.0017	0.000098	ug/Kg	☼	05/11/18 11:03	05/20/18 00:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*62*		*24 - 169*	*05/11/18 11:03*	*05/20/18 00:46*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*90*		*35 - 197*	*05/11/18 11:03*	*05/20/18 00:46*	*1*

Client Sample ID: PDI-SG-S230
Date Collected: 05/01/18 14:45
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-11
Matrix: Solid
Percent Solids: 30.7

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00075	J q	0.0016	0.00015	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,7,8-PeCDD	0.0025	J	0.0081	0.00027	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,7,8-PeCDF	0.0023	J B	0.0081	0.00028	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
2,3,4,7,8-PeCDF	0.0028	J	0.0081	0.00030	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,4,7,8-HxCDD	0.0046	J B	0.0081	0.00022	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,6,7,8-HxCDD	0.017		0.0081	0.00022	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,7,8,9-HxCDD	0.0079	J	0.0081	0.00020	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,4,7,8-HxCDF	0.0092		0.0081	0.00052	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,6,7,8-HxCDF	0.0044	J	0.0081	0.00049	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,7,8,9-HxCDF	0.00047	J B	0.0081	0.00035	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
2,3,4,6,7,8-HxCDF	0.0023	J	0.0081	0.00037	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,4,6,7,8-HpCDD	0.44	B	0.0081	0.0034	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,4,6,7,8-HpCDF	0.086		0.0081	0.0018	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
1,2,3,4,7,8,9-HpCDF	0.0055	J B	0.0081	0.0021	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
OCDD	3.4	B	0.016	0.0018	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1
OCDF	0.25		0.016	0.00034	ug/Kg	☼	05/11/18 11:03	05/19/18 02:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*60*		*25 - 164*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-2,3,7,8-TCDF	*67*		*24 - 169*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,7,8-PeCDD	*61*		*25 - 181*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,7,8-PeCDF	*62*		*24 - 185*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-2,3,4,7,8-PeCDF	*63*		*21 - 178*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,4,7,8-HxCDD	*56*		*32 - 141*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,6,7,8-HxCDD	*51*		*28 - 130*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,4,7,8-HxCDF	*55*		*26 - 152*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,6,7,8-HxCDF	*53*		*26 - 123*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-2,3,4,6,7,8-HxCDF	*55*		*28 - 136*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,7,8,9-HxCDF	*57*		*29 - 147*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*37*		*23 - 140*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*29*		*28 - 143*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*34*		*26 - 138*	*05/11/18 11:03*	*05/19/18 02:45*	*1*
13C-OCDD	*34*		*17 - 157*	*05/11/18 11:03*	*05/19/18 02:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*110*		*35 - 197*	*05/11/18 11:03*	*05/19/18 02:45*	*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	0.0031		0.0016	0.000085	ug/Kg	☼	05/11/18 11:03	05/20/18 01:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*05/11/18 11:03*	*05/20/18 01:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*97*		*35 - 197*	*05/11/18 11:03*	*05/20/18 01:23*	*1*

Client Sample ID: PDI-SG-S234
Date Collected: 05/01/18 15:30
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-12
Matrix: Solid
Percent Solids: 28.5

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.00064	J q	0.0017	0.00017	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,7,8-PeCDD	0.0027	J	0.0087	0.00023	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,7,8-PeCDF	0.0019	J B	0.0087	0.00028	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
2,3,4,7,8-PeCDF	0.0028	J	0.0087	0.00030	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,4,7,8-HxCDD	0.0052	J B	0.0087	0.00030	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,6,7,8-HxCDD	0.019		0.0087	0.00027	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,7,8,9-HxCDD	0.0088		0.0087	0.00025	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,4,7,8-HxCDF	0.0087		0.0087	0.00062	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,6,7,8-HxCDF	0.0046	J	0.0087	0.00057	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,7,8,9-HxCDF	0.00065	J q B	0.0087	0.00042	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
2,3,4,6,7,8-HxCDF	0.0026	J	0.0087	0.00043	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,4,6,7,8-HpCDD	0.54	B	0.0087	0.0045	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,4,6,7,8-HpCDF	0.091		0.0087	0.0020	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
1,2,3,4,7,8,9-HpCDF	0.0056	J B	0.0087	0.0023	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
OCDD	4.1	B	0.017	0.0022	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1
OCDF	0.27		0.017	0.00034	ug/Kg	☼	05/11/18 11:03	05/19/18 03:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*60*		*25 - 164*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*25 - 181*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,7,8-PeCDF	*62*		*24 - 185*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-2,3,4,7,8-PeCDF	*64*		*21 - 178*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,4,7,8-HxCDD	*61*		*32 - 141*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,4,7,8-HxCDF	*61*		*26 - 152*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-2,3,4,6,7,8-HxCDF	*62*		*28 - 136*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,7,8,9-HxCDF	*59*		*29 - 147*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*35*		*28 - 143*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*44*		*26 - 138*	*05/11/18 11:03*	*05/19/18 03:33*	*1*
13C-OCDD	*45*		*17 - 157*	*05/11/18 11:03*	*05/19/18 03:33*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*107*		*35 - 197*	*05/11/18 11:03*	*05/19/18 03:33*	*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	0.0025		0.0017	0.000090	ug/Kg	☼	05/11/18 11:03	05/20/18 02:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*05/11/18 11:03*	*05/20/18 02:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*90*		*35 - 197*	*05/11/18 11:03*	*05/20/18 02:01*	*1*

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

Lab Sample ID: MB 320-222717/1-A
Matrix: Solid
Analysis Batch: 223937

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 222717

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.0010	0.000079	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
2,3,7,8-TCDF	ND		0.0010	0.000060	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000076	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,7,8-PeCDF	0.0000611	J q	0.0050	0.000046	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000051	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,4,7,8-HxCDD	0.000133	J q	0.0050	0.000054	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000051	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000047	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000058	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000053	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,7,8,9-HxCDF	0.000196	J q	0.0050	0.000042	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000041	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,4,6,7,8-HpCDD	0.000105	J q	0.0050	0.000046	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,4,6,7,8-HpCDF	ND		0.0050	0.000040	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
1,2,3,4,7,8,9-HpCDF	0.000171	J q	0.0050	0.000050	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
OCDD	0.000369	J	0.010	0.000050	ug/Kg		05/11/18 11:03	05/18/18 18:41	1
OCDF	ND		0.010	0.000094	ug/Kg		05/11/18 11:03	05/18/18 18:41	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*67*		*25 - 164*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-2,3,7,8-TCDF	*73*		*24 - 169*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,7,8-PeCDD	*73*		*25 - 181*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,7,8-PeCDF	*70*		*24 - 185*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-2,3,4,7,8-PeCDF	*70*		*21 - 178*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,4,7,8-HxCDD	*67*		*32 - 141*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,6,7,8-HxCDD	*75*		*28 - 130*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,4,7,8-HxCDF	*73*		*26 - 152*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,6,7,8-HxCDF	*74*		*26 - 123*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-2,3,4,6,7,8-HxCDF	*73*		*28 - 136*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,7,8,9-HxCDF	*71*		*29 - 147*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*66*		*23 - 140*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*63*		*28 - 143*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*65*		*26 - 138*	*05/11/18 11:03*	*05/18/18 18:41*	*1*
13C-OCDD	*74*		*17 - 157*	*05/11/18 11:03*	*05/18/18 18:41*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*05/11/18 11:03*	*05/18/18 18:41*	*1*

Lab Sample ID: LCS 320-222717/2-A
Matrix: Solid
Analysis Batch: 223937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 222717

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	0.0200	0.0206		ug/Kg		103	67 - 158
2,3,7,8-TCDF	0.0200	0.0198		ug/Kg		99	75 - 158
1,2,3,7,8-PeCDD	0.100	0.104		ug/Kg		104	70 - 142
1,2,3,7,8-PeCDF	0.100	0.105		ug/Kg		105	80 - 134
2,3,4,7,8-PeCDF	0.100	0.103		ug/Kg		103	68 - 160

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

Lab Sample ID: LCS 320-222717/2-A
Matrix: Solid
Analysis Batch: 223937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 222717

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2,3,4,7,8-HxCDD			0.100	0.101		ug/Kg		101	70 - 164		
1,2,3,6,7,8-HxCDD			0.100	0.100		ug/Kg		100	76 - 134		
1,2,3,7,8,9-HxCDD			0.100	0.107		ug/Kg		107	64 - 162		
1,2,3,4,7,8-HxCDF			0.100	0.104		ug/Kg		104	72 - 134		
1,2,3,6,7,8-HxCDF			0.100	0.101		ug/Kg		101	84 - 130		
1,2,3,7,8,9-HxCDF			0.100	0.102		ug/Kg		102	78 - 130		
2,3,4,6,7,8-HxCDF			0.100	0.102		ug/Kg		102	70 - 156		
1,2,3,4,6,7,8-HpCDD			0.100	0.105		ug/Kg		105	70 - 140		
1,2,3,4,6,7,8-HpCDF			0.100	0.102		ug/Kg		102	82 - 122		
1,2,3,4,7,8,9-HpCDF			0.100	0.0985		ug/Kg		99	78 - 138		
OCDD			0.200	0.199		ug/Kg		99	78 - 144		
OCDF			0.200	0.181		ug/Kg		90	63 - 170		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*63*		*20 - 175*
13C-2,3,7,8-TCDF	*66*		*22 - 152*
13C-1,2,3,7,8-PeCDD	*65*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*63*		*21 - 192*
13C-2,3,4,7,8-PeCDF	*64*		*13 - 328*
13C-1,2,3,4,7,8-HxCDD	*64*		*21 - 193*
13C-1,2,3,6,7,8-HxCDD	*68*		*25 - 163*
13C-1,2,3,4,7,8-HxCDF	*64*		*19 - 202*
13C-1,2,3,6,7,8-HxCDF	*67*		*21 - 159*
13C-2,3,4,6,7,8-HxCDF	*67*		*22 - 176*
13C-1,2,3,7,8,9-HxCDF	*65*		*17 - 205*
13C-1,2,3,4,6,7,8-HpCDD	*63*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*60*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*62*		*20 - 186*
13C-OCDD	*67*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*99*		*31 - 191*

Lab Sample ID: LCSD 320-222717/3-A
Matrix: Solid
Analysis Batch: 223937

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 222717

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,3,7,8-TCDD			0.0200	0.0202		ug/Kg		101	67 - 158	2	50
2,3,7,8-TCDF			0.0200	0.0203		ug/Kg		101	75 - 158	2	50
1,2,3,7,8-PeCDD			0.100	0.102		ug/Kg		102	70 - 142	2	50
1,2,3,7,8-PeCDF			0.100	0.101		ug/Kg		101	80 - 134	4	50
2,3,4,7,8-PeCDF			0.100	0.101		ug/Kg		101	68 - 160	2	50
1,2,3,4,7,8-HxCDD			0.100	0.0985		ug/Kg		99	70 - 164	2	50
1,2,3,6,7,8-HxCDD			0.100	0.101		ug/Kg		101	76 - 134	1	50
1,2,3,7,8,9-HxCDD			0.100	0.102		ug/Kg		102	64 - 162	4	50
1,2,3,4,7,8-HxCDF			0.100	0.102		ug/Kg		102	72 - 134	2	50
1,2,3,6,7,8-HxCDF			0.100	0.0991		ug/Kg		99	84 - 130	2	50

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

Lab Sample ID: LCSD 320-222717/3-A
Matrix: Solid
Analysis Batch: 223937

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 222717

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8,9-HxCDF			0.100	0.0995		ug/Kg		99	78 - 130	2	50
2,3,4,6,7,8-HxCDF			0.100	0.102		ug/Kg		102	70 - 156	1	50
1,2,3,4,6,7,8-HpCDD			0.100	0.103		ug/Kg		103	70 - 140	1	50
1,2,3,4,6,7,8-HpCDF			0.100	0.102		ug/Kg		102	82 - 122	0	50
1,2,3,4,7,8,9-HpCDF			0.100	0.0971		ug/Kg		97	78 - 138	1	50
OCDD			0.200	0.197		ug/Kg		98	78 - 144	1	50
OCDF			0.200	0.183		ug/Kg		91	63 - 170	1	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*66*		*20 - 175*
13C-2,3,7,8-TCDF	*69*		*22 - 152*
13C-1,2,3,7,8-PeCDD	*70*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*68*		*21 - 192*
13C-2,3,4,7,8-PeCDF	*69*		*13 - 328*
13C-1,2,3,4,7,8-HxCDD	*68*		*21 - 193*
13C-1,2,3,6,7,8-HxCDD	*70*		*25 - 163*
13C-1,2,3,4,7,8-HxCDF	*66*		*19 - 202*
13C-1,2,3,6,7,8-HxCDF	*70*		*21 - 159*
13C-2,3,4,6,7,8-HxCDF	*67*		*22 - 176*
13C-1,2,3,7,8,9-HxCDF	*68*		*17 - 205*
13C-1,2,3,4,6,7,8-HpCDD	*63*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*62*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*62*		*20 - 186*
13C-OCDD	*68*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*105*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-77000-2

Client Sample ID: PDI-SG-S211 — Lab Sample ID: 580-77000-1

Date Collected: 04/30/18 14:05 — **Matrix: Solid**
Date Received: 05/02/18 13:55 — **Percent Solids: 31.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 04:40	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223935	05/18/18 12:32	AS	TAL SAC

Client Sample ID: PDI-SG-S213 — Lab Sample ID: 580-77000-2

Date Collected: 04/30/18 15:05 — **Matrix: Solid**
Date Received: 05/02/18 13:55 — **Percent Solids: 30.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 05:18	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223935	05/18/18 13:20	AS	TAL SAC

Client Sample ID: PDI-SG-S220 — Lab Sample ID: 580-77000-3

Date Collected: 04/30/18 16:20 — **Matrix: Solid**
Date Received: 05/02/18 13:55 — **Percent Solids: 34.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 05:56	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223935	05/18/18 14:09	AS	TAL SAC

Client Sample ID: PDI-SG-S215 — Lab Sample ID: 580-77000-4

Date Collected: 04/30/18 17:42 — **Matrix: Solid**
Date Received: 05/02/18 13:55 — **Percent Solids: 28.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 06:34	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/18/18 21:06	AS	TAL SAC

Client Sample ID: PDI-SG-S241 — Lab Sample ID: 580-77000-5

Date Collected: 05/01/18 16:50 — **Matrix: Solid**
Date Received: 05/02/18 13:55 — **Percent Solids: 38.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 07:11	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77000-2

Client Sample ID: PDI-SG-S241
Date Collected: 05/01/18 16:50
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-5
Matrix: Solid
Percent Solids: 38.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1613B		1	223937	05/18/18 21:55	AS	TAL SAC

Client Sample ID: PDI-SG-S235
Date Collected: 05/01/18 17:35
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-6
Matrix: Solid
Percent Solids: 31.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 07:49	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/18/18 22:43	AS	TAL SAC

Client Sample ID: PDI-SG-S238
Date Collected: 05/01/18 16:10
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-7
Matrix: Solid
Percent Solids: 31.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 08:27	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/18/18 23:31	AS	TAL SAC

Client Sample ID: PDI-SG-S223
Date Collected: 05/01/18 11:00
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-8
Matrix: Solid
Percent Solids: 41.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 09:05	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/19/18 00:20	AS	TAL SAC

Client Sample ID: PDI-SG-S225
Date Collected: 05/01/18 12:00
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-9
Matrix: Solid
Percent Solids: 33.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224534	05/19/18 09:43	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/19/18 01:08	AS	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77000-2

Client Sample ID: PDI-SG-S231

Date Collected: 05/01/18 13:50
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-10

Matrix: Solid
Percent Solids: 30.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224541	05/20/18 00:46	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/19/18 01:57	AS	TAL SAC

Client Sample ID: PDI-SG-S230

Date Collected: 05/01/18 14:45
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-11

Matrix: Solid
Percent Solids: 30.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224541	05/20/18 01:23	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/19/18 02:45	AS	TAL SAC

Client Sample ID: PDI-SG-S234

Date Collected: 05/01/18 15:30
Date Received: 05/02/18 13:55

Lab Sample ID: 580-77000-12

Matrix: Solid
Percent Solids: 28.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	224541	05/20/18 02:01	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			222717	05/11/18 11:03	SR1	TAL SAC
Total/NA	Analysis	1613B		1	223937	05/19/18 03:33	AS	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM
TestAmerica Job ID: 580-77000-2
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	06-30-18
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: 580-77000-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77000-1	PDI-SG-S211	Solid	04/30/18 14:05	05/02/18 13:55
580-77000-2	PDI-SG-S213	Solid	04/30/18 15:05	05/02/18 13:55
580-77000-3	PDI-SG-S220	Solid	04/30/18 16:20	05/02/18 13:55
580-77000-4	PDI-SG-S215	Solid	04/30/18 17:42	05/02/18 13:55
580-77000-5	PDI-SG-S241	Solid	05/01/18 16:50	05/02/18 13:55
580-77000-6	PDI-SG-S235	Solid	05/01/18 17:35	05/02/18 13:55
580-77000-7	PDI-SG-S238	Solid	05/01/18 16:10	05/02/18 13:55
580-77000-8	PDI-SG-S223	Solid	05/01/18 11:00	05/02/18 13:55
580-77000-9	PDI-SG-S225	Solid	05/01/18 12:00	05/02/18 13:55
580-77000-10	PDI-SG-S231	Solid	05/01/18 13:50	05/02/18 13:55
580-77000-11	PDI-SG-S230	Solid	05/01/18 14:45	05/02/18 13:55
580-77000-12	PDI-SG-S234	Solid	05/01/18 15:30	05/02/18 13:55

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 / Michaela McCoog** **Laboratory Contact: Elaine-Walker**	**Date: 5/02/18** **Carrier: Courier**	COC No: 2 1 of 2 page(s)
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 _____			

580-77000 Chain of Custody

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-S211	4/30/2018	14:05	SS		TP	5		x	x	x	x	x	
PDI-SG-S213	4/30/2018	15:05	SS		TP	5		x	x	x	x	x	
PDI-SG-S220	4/30/2018	16:20	SS		TP	5		x	x	x	x	x	
PDI-SG-S215	4/30/2018	17:42	SS		TP	5		x	x	x	x	x	
PDI-SG-S241	5/1/2018	16:50	SS		TP	5		x	x	x	x	x	
PDI-SG-S235	5/1/2018	17:35	SS		MM	5		x	x	x	x	x	
PDI-SG-S238	5/1/2018	16:10	SS		MM	5		x	x	x	x	x	
PDI-SG-S223	5/1/2018	11:00	SS		MM	5		x	x	x	x	x	
PDI-SG-S225	5/1/2018	12:00	SS		MM	5		x	x	x	x	x	
PDI-SG-S231	5/1/2018	13:50	SS		MM	5		x	x	x	x	x	
PDI-SG-S230	5/1/2018	14:45	SS		MM	5		x	x	x	x	x	
PDI-SG-S234	5/1/2018	15:30	SS		MM	5		x	x	x	x	x	

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

1.3, 23

Relinquished by:	Company: Accom	Date/Time: 5/2/18 1247	Received by:	Company: M.E.	Date/Time: 5/2/18 1247
Relinquished by:	Company: M.E.	Date/Time: 5/2/18 1355	Received by:	Company: TA-POR	Date/Time: 5/2/18 1355
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

5/30/2018

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: 580-55066.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77000-2
Address: 880 Riverside Parkway, ,	Due Date Requested: 5/18/2018			
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)	1613B/HRMS_Sox_P Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S211 (580-77000-1)	4/30/18	14:05 Pacific		Solid			X	2	
PDI-SG-S213 (580-77000-2)	4/30/18	15:05 Pacific		Solid			X	2	
PDI-SG-S220 (580-77000-3)	4/30/18	16:20 Pacific		Solid			X	2	
PDI-SG-S215 (580-77000-4)	4/30/18	17:42 Pacific		Solid			X	2	
PDI-SG-S241 (580-77000-5)	5/1/18	16:50 Pacific		Solid			X	2	
PDI-SG-S235 (580-77000-6)	5/1/18	17:35 Pacific		Solid			X	2	
PDI-SG-S238 (580-77000-7)	5/1/18	16:10 Pacific		Solid			X	2	
PDI-SG-S223 (580-77000-8)	5/1/18	11:00 Pacific		Solid			X	2	
PDI-SG-S225 (580-77000-9)	5/1/18	12:00 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:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	[signature]	5/3/18 1300	TAL SAC	[signature]	5/7/18 0930	TA-SAC
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	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: 3.1°C; T=12.6°C meltwater AK-5. JM 5/7/18

Ver: 09/20/2016

Page 27 of 42

5/30/2018

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: 580-55066.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77000-2
Address: 880 Riverside Parkway,	Due Date Requested: 5/18/2018			
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)	1613B/HRMS_Sox_P Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
T PDI-SG-S231 (580-77000-10)	5/1/18	13:50 Pacific		Solid			X	2	
T PDI-SG-S230 (580-77000-11)	5/1/18	14:45 Pacific		Solid			X	2	
T PDI-SG-S234 (580-77000-12)	5/1/18	15:30 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. I

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]	5/3/18 1300	TAKOR	[signature]	5/7/18 0930	TA-SAC
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.1°C; T=12.6°C ice Hunter ALS. RLT 5/7/18

Ver: 09/20/2016

5/30/2018

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: 580-55066.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77000-4
Address: 880 Riverside Parkway, ,	Due Date Requested: 5/18/2018			
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)	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S211 (580-77000-1)	4/30/18	14:05 Pacific		Solid			X	2	
PDI-SG-S213 (580-77000-2)	4/30/18	15:05 Pacific		Solid			X	2	
PDI-SG-S220 (580-77000-3)	4/30/18	16:20 Pacific		Solid			X	2	
PDI-SG-S215 (580-77000-4)	4/30/18	17:42 Pacific		Solid			X	2	
PDI-SG-S241 (580-77000-5)	5/1/18	16:50 Pacific		Solid			X	2	
PDI-SG-S235 (580-77000-6)	5/1/18	17:35 Pacific		Solid			X	2	
PDI-SG-S238 (580-77000-7)	5/1/18	16:10 Pacific		Solid			X	2	
PDI-SG-S223 (580-77000-8)	5/1/18	11:00 Pacific		Solid			X	2	
PDI-SG-S225 (580-77000-9)	5/1/18	12:00 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:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	5/3/18 1300	IMOR	[signature]	5/7/18 0930	TA - SAC
2	[signature]					
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.1°C; T=0.6°C melt water ALS TDM 5/7/18

Ver: 09/20/2016

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5/30/2018

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: 580-55066.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77000-4
Address: 880 Riverside Parkway,	Due Date Requested: 5/18/2018			
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)	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
PDI-SG-S231 (580-77000-10)	5/1/18	13:50 Pacific		Solid			X	2	
PDI-SG-S230 (580-77000-11)	5/1/18	14:45 Pacific		Solid			X	2	
PDI-SG-S234 (580-77000-12)	5/1/18	15:30 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. I

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:	5/3/18 1300	TAL SAC	Lucy A. Ingram	5/7/18 0930	TA-SAC
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: T= 12.6°C melt water AK-5 TM 5/7/18

Ver: 09/20/2016

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5/30/2018

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77000-2

Login Number: 77000
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: 580-77000-2

Login Number: 77000
List Number: 3
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 05/04/18 05:49 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.1
COC is present.	False	Missing COC, COC can be in missing cooler.
COC is filled out in ink and legible.	N/A	
COC is filled out with all pertinent information.	N/A	
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	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77000-2

Login Number: 77000
List Number: 4
Creator: Turpen, Troy

List Source: TestAmerica Sacramento
List Creation: 05/07/18 11:59 AM

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.	False	Received broken
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.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	12.6 C, AK-5
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").	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

S 580-77000 Field Sheet

Job:_____

Tracking # 7808 2920 6744 SO / (PO) / FO

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-4 / (AK-5) / HACCP / Other**_____

Ice_____ Wet_____ Gel_____ Other melt water

Cooler Custody Seal: Broken

Sample Custody Seal: —

Cooler ID: —

Temp: Observed 12.6 °C

From: Temp Blank ☐ Sample ☑

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has 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: JW Date: 5/7/18 Time 1030

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

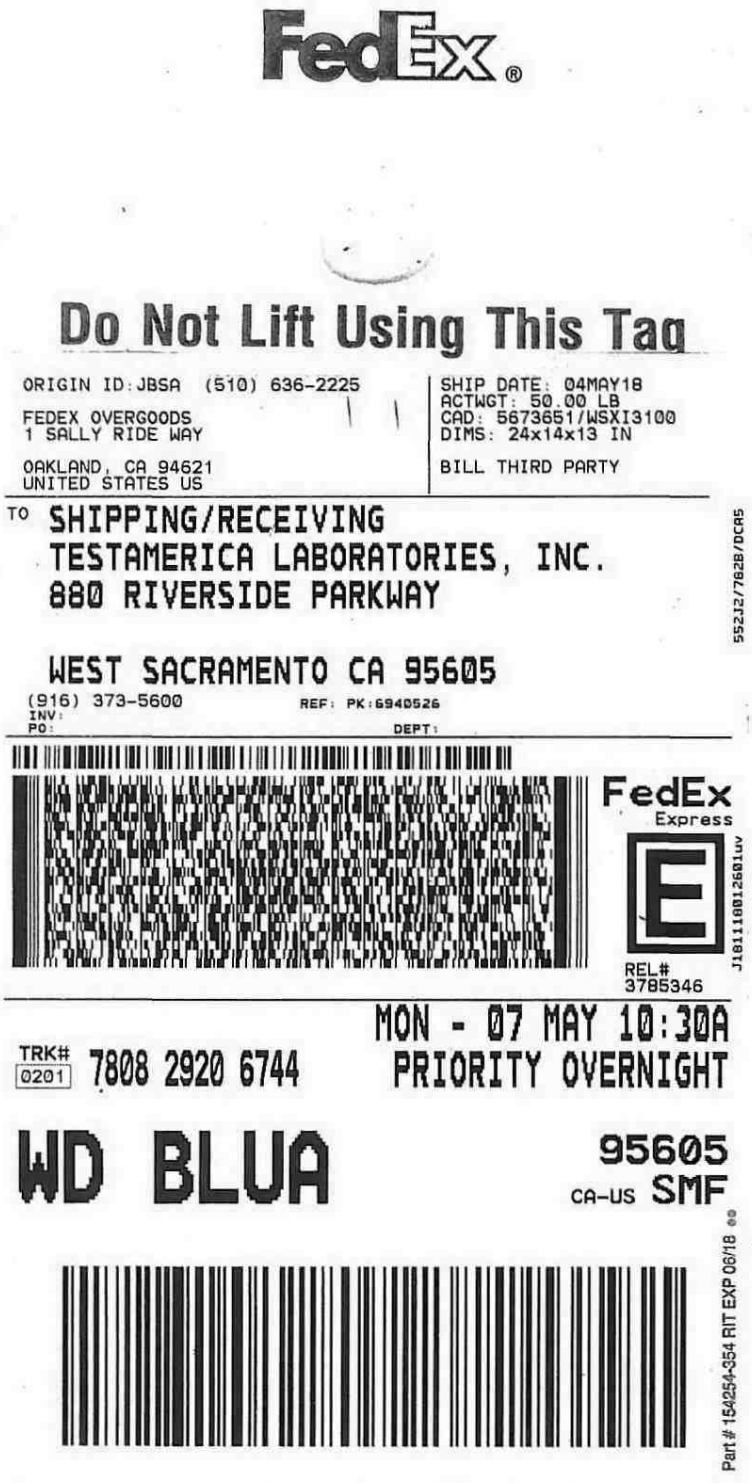
Date: 3/18

Siature:

CUSTODY SEAL

ENVIRONMENTAL SAMPLING SUPPLY

www.essvial.com 800-233-8425



FedEx

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ORIGIN ID:JBSA (510) 636-2225
FEDEX OVERGOODS
1 SALLY RIDE WAY
OAKLAND, CA 94621
UNITED STATES US

SHIP DATE: 04MAY18
ACTWGT: 50.00 LB
CAD: 5673651/WSXI3100
DIMS: 24x14x13 IN
BILL THIRD PARTY

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605
(916) 373-5600 REF: PK:6940526
INV:
PO: DEPT:

552J2/782B/DCA5

FedEx Express

J1811160812601uv

REL# 3785346

MON - 07 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7808 2920 6744

WD BLUA

95605
CA-US SMF

Part # 154254-354 RIT EXP 06/18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sa 
580-77000 Field Sheet

Job:_____

Tracking # 7808 2920 6744 SO / (PO) / FO

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-4 / (AK-5) / HACCP / Other**_____

Ice_____ Wet_____ Gel_____ Other melt water

Cooler Custody Seal: Broken

Sample Custody Seal: —

Cooler ID: —

Temp: Observed 12.6 °C

From: Temp Blank ☐ Sample ☑

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has 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: RW Date: 5/7/18 Time 1030

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

Date: 3/18

Siature:

CUSTODY SEAL

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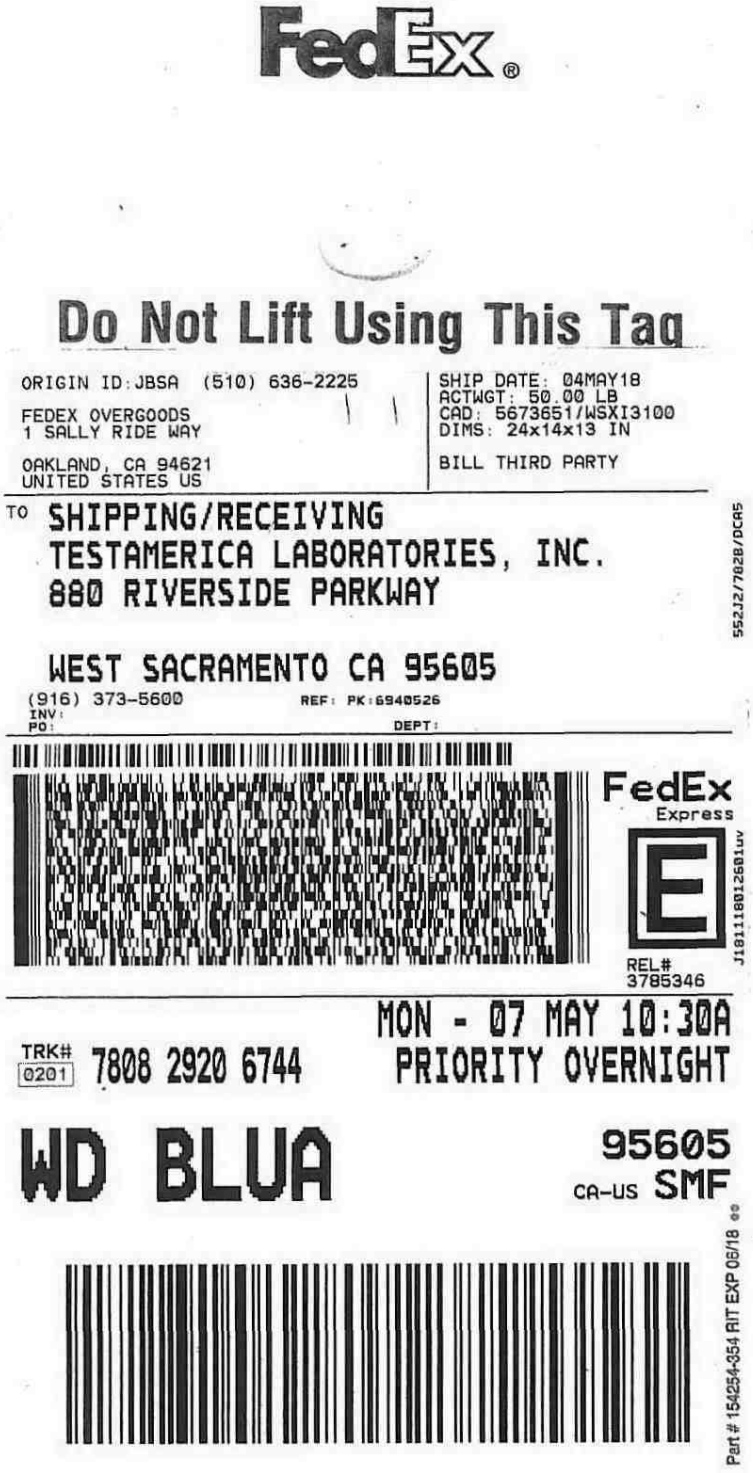

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TESTAMERICA LABORATORIES, INC.
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Part # 154254-354 RIT EXP 05/18

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77000-2

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	TCDD (25-164)	TCDF (24-169)	PeCDD (25-181)	PeCDF (24-185)	PeCF (21-178)	HxCDD (32-141)	HxDD (28-130)	HxCDF (26-152)
580-77000-1	PDI-SG-S211	58	63	55	56	59	51	45	50
580-77000-1 - RA	PDI-SG-S211		63						
580-77000-2	PDI-SG-S213	59	67	58	60	63	53	50	53
580-77000-2 - RA	PDI-SG-S213		67						
580-77000-3	PDI-SG-S220	64	68	65	66	66	61	59	61
580-77000-3 - RA	PDI-SG-S220		66						
580-77000-4	PDI-SG-S215	56	65	51	52	57	42	44	43
580-77000-4 - RA	PDI-SG-S215		65						
580-77000-5	PDI-SG-S241	59	64	61	60	60	57	59	57
580-77000-5 - RA	PDI-SG-S241		61						
580-77000-6	PDI-SG-S235	64	70	66	66	68	62	63	62
580-77000-6 - RA	PDI-SG-S235		67						
580-77000-7	PDI-SG-S238	61	65	66	64	66	63	58	61
580-77000-7 - RA	PDI-SG-S238		66						
580-77000-8	PDI-SG-S223	64	68	67	68	66	63	58	64
580-77000-8 - RA	PDI-SG-S223		72						
580-77000-9	PDI-SG-S225	57	65	54	55	59	46	43	48
580-77000-9 - RA	PDI-SG-S225		66						
580-77000-10	PDI-SG-S231	60	67	58	59	63	54	51	56
580-77000-10 - RA	PDI-SG-S231		62						
580-77000-11	PDI-SG-S230	60	67	61	62	63	56	51	55
580-77000-11 - RA	PDI-SG-S230		66						
580-77000-12	PDI-SG-S234	60	66	62	62	64	61	59	61
580-77000-12 - RA	PDI-SG-S234		63						
MB 320-222717/1-A	Method Blank	67	73	73	70	70	67	75	73

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	HxDF (26-123)	13CHxCF (28-136)	HxCF (29-147)	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	OCDD (17-157)
580-77000-1	PDI-SG-S211	47	50	52	32	24 *	34	28
580-77000-1 - RA	PDI-SG-S211							
580-77000-2	PDI-SG-S213	49	53	56	38	27 *	39	35
580-77000-2 - RA	PDI-SG-S213							
580-77000-3	PDI-SG-S220	59	64	63	47	36	46	49
580-77000-3 - RA	PDI-SG-S220							
580-77000-4	PDI-SG-S215	42	47	48	28	20 *	30	22
580-77000-4 - RA	PDI-SG-S215							
580-77000-5	PDI-SG-S241	58	60	60	46	37	43	46
580-77000-5 - RA	PDI-SG-S241							
580-77000-6	PDI-SG-S235	61	63	63	45	36	42	43
580-77000-6 - RA	PDI-SG-S235							
580-77000-7	PDI-SG-S238	61	63	62	44	33	41	44
580-77000-7 - RA	PDI-SG-S238							
580-77000-8	PDI-SG-S223	63	64	64	48	37	40	48
580-77000-8 - RA	PDI-SG-S223							
580-77000-9	PDI-SG-S225	44	48	49	30	22 *	29	25
580-77000-9 - RA	PDI-SG-S225							
580-77000-10	PDI-SG-S231	53	55	56	37	27 *	35	34
580-77000-10 - RA	PDI-SG-S231							
580-77000-11	PDI-SG-S230	53	55	57	37	29	34	34

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77000-2

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HxDF (26-123)	13CHxCF (28-136)	HxCF (29-147)	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	OCDD (17-157)	
580-77000-11 - RA	PDI-SG-S230								
580-77000-12	PDI-SG-S234	58	62	59	45	35	44	45	
580-77000-12 - RA	PDI-SG-S234								
MB 320-222717/1-A	Method Blank	74	73	71	66	63	65	74	

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF = 13C-1,2,3,7,8-PeCDF
PeCF = 13C-2,3,4,7,8-PeCDF
HxCDD = 13C-1,2,3,4,7,8-HxCDD
HxDD = 13C-1,2,3,6,7,8-HxCDD
HxCDF = 13C-1,2,3,4,7,8-HxCDF
HxDF = 13C-1,2,3,6,7,8-HxCDF
13CHxCF = 13C-2,3,4,6,7,8-HxCDF
HxCF = 13C-1,2,3,7,8,9-HxCDF
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
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	TCDD (20-175)	TCDF (22-152)	PeCDD (21-227)	PeCDF (21-192)	PeCF (13-328)	HxCDD (21-193)	HxDD (25-163)	HxCDF (19-202)
LCS 320-222717/2-A	Lab Control Sample	63	66	65	63	64	64	68	64
LCSD 320-222717/3-A	Lab Control Sample Dup	66	69	70	68	69	68	70	66

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HxDF (21-159)	13CHxCF (22-176)	HxCF (17-205)	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	OCDD (13-199)	
LCS 320-222717/2-A	Lab Control Sample	67	67	65	63	60	62	67	
LCSD 320-222717/3-A	Lab Control Sample Dup	70	67	68	63	62	62	68	

Surrogate Legend

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