TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-78604-8
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Authorized for release by:
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Job ID: 580-78604-8

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-78604-8

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

Ten samples were received on 7/5/2018 3:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.3º C, 0.7º C and 2.2º C.

The following samples were activated by the client on 8/16/18 for all On Hold analysis: PDI-SG-B458 (580-78604-1), PDI-SG-B470 (580-78604-2), PDI-SG-B469 (580-78604-3), PDI-SG-B456 (580-78604-4), PDI-SG-B462 (580-78604-5), PDI-SG-B463 (580-78604-6), PDI-SG-B463 (580-78604-6[MS]), PDI-SG-B463 (580-78604-6[MSD]), PDI-SG-B464 (580-78604-7), PDI-SG-B466 (580-78604-8), PDI-SG-B468 (580-78604-9), PDI-SG-B429 (580-78604-10) and PDI-RB-VV-180703 (580-78604-11)

The following samples were canceled by the client for Atterberg Limits on 8/23/18: PDI-SG-B470 (580-78604-2), PDI-SG-B469 (580-78604-3), PDI-SG-B462 (580-78604-5), PDI-SG-B463 (580-78604-6), PDI-SG-B466 (580-78604-8) and PDI-SG-B468 (580-78604-9).

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

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

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

DIOXIN/ FURAN

Samples PDI-SG-B458 (580-78604-1), PDI-SG-B470 (580-78604-2), PDI-SG-B469 (580-78604-3), PDI-SG-B456 (580-78604-4), PDI-SG-B462 (580-78604-5), PDI-SG-B463 (580-78604-6), PDI-SG-B464 (580-78604-7), PDI-SG-B466 (580-78604-8), PDI-SG-B468 (580-78604-9) and PDI-SG-B429 (580-78604-10) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 09/04/2018 and analyzed on 09/07/2018, 09/08/2018 and 09/10/2018.

Several analytes were detected in method blank MB 320-243668/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-B458 (580-78604-1), PDI-SG-B470 (580-78604-2), PDI-SG-B469 (580-78604-3),

Job ID: 580-78604-8 (Continued)

Laboratory: TestAmerica Seattle (Continued)

PDI-SG-B456 (580-78604-4), PDI-SG-B462 (580-78604-5), PDI-SG-B463 (580-78604-6), PDI-SG-B464 (580-78604-7), PDI-SG-B466 (580-78604-8), PDI-SG-B468 (580-78604-9), PDI-SG-B429 (580-78604-10), (CCV 320-244513/27), (LCS 320-243668/2-A), (LCSD 320-243668/3-A), (MB 320-243668/1-A), and (CCV 320-244511/14). 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.

The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range: PDI-SG-B458 (580-78604-1). These analytes have been qualified; however, the peak did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

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: 580-78604-8

Qualifiers

Dioxin

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

Glossary

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

Client Sample ID: PDI-SG-B458
Date Collected: 07/02/18 11:00
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-1
Matrix: Solid
Percent Solids: 57.7

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.30	B	0.0043	0.0013	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,4,6,7,8-HpCDF	0.060	B	0.0043	0.00072	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,4,7,8,9-HpCDF	0.0049	B	0.0043	0.00073	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,4,7,8-HxCDD	0.0017	J B	0.0043	0.00025	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,4,7,8-HxCDF	0.0027	J B	0.0043	0.00040	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,6,7,8-HxCDD	0.0087		0.0043	0.00023	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,6,7,8-HxCDF	0.0029	J B	0.0043	0.00036	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,7,8,9-HxCDD	0.0036	J B	0.0043	0.00022	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,7,8,9-HxCDF	0.0018	J B	0.0043	0.00031	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,7,8-PeCDD	0.00085	J	0.0043	0.00012	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
1,2,3,7,8-PeCDF	0.00080	J B	0.0043	0.00012	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
2,3,4,6,7,8-HxCDF	0.00088	J	0.0043	0.00029	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
2,3,4,7,8-PeCDF	0.00054	J	0.0043	0.00014	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
2,3,7,8-TCDD	0.00038	J q	0.00086	0.00013	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
OCDD	7.2	E B	0.0086	0.0015	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1
OCDF	0.37	B	0.0086	0.00030	ug/Kg	☼	09/04/18 09:00	09/07/18 18:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*43*		*23 - 140*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*35*		*28 - 143*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*42*		*26 - 138*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,4,7,8-HxCDD	*53*		*32 - 141*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,4,7,8-HxCDF	*61*		*26 - 152*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,6,7,8-HxCDD	*55*		*28 - 130*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,6,7,8-HxCDF	*67*		*26 - 123*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,7,8,9-HxCDF	*58*		*29 - 147*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,7,8-PeCDD	*61*		*25 - 181*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-1,2,3,7,8-PeCDF	*59*		*24 - 185*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-2,3,4,7,8-PeCDF	*58*		*21 - 178*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-2,3,7,8-TCDD	*68*		*25 - 164*	*09/04/18 09:00*	*09/07/18 18:41*	*1*
13C-OCDD	*40*		*17 - 157*	*09/04/18 09:00*	*09/07/18 18:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*130*		*35 - 197*	*09/04/18 09:00*	*09/07/18 18:41*	*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	ND		0.00086	0.000039	ug/Kg	☼	09/04/18 09:00	09/10/18 22:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*89*		*24 - 169*	*09/04/18 09:00*	*09/10/18 22:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*09/04/18 09:00*	*09/10/18 22:45*	*1*

Client Sample ID: PDI-SG-B470
Date Collected: 07/02/18 15:20
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-2
Matrix: Solid
Percent Solids: 58.9

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.017	B	0.0042	0.00014	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,4,6,7,8-HpCDF	0.0037	J q B	0.0042	0.00010	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,4,7,8,9-HpCDF	0.00086	J B	0.0042	0.00011	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,4,7,8-HxCDD	0.00042	J B	0.0042	0.000080	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,4,7,8-HxCDF	0.00034	J B	0.0042	0.00010	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,6,7,8-HxCDD	0.00091	J	0.0042	0.000076	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,6,7,8-HxCDF	0.00024	J B	0.0042	0.000089	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,7,8,9-HxCDD	0.0011	J B	0.0042	0.000072	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,7,8,9-HxCDF	0.0017	J B	0.0042	0.000075	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,7,8-PeCDD	0.00019	J	0.0042	0.000061	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
1,2,3,7,8-PeCDF	0.00032	J B	0.0042	0.000054	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
2,3,4,6,7,8-HxCDF	0.00016	J	0.0042	0.000074	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
2,3,4,7,8-PeCDF	0.00012	J	0.0042	0.000062	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
2,3,7,8-TCDD	0.00012	J q	0.00085	0.000061	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
2,3,7,8-TCDF	0.00023	J q B	0.00085	0.000033	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
OCDD	0.15	B	0.0085	0.00015	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1
OCDF	0.012	B	0.0085	0.00014	ug/Kg	☼	09/04/18 09:00	09/07/18 19:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*53*		*23 - 140*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*43*		*28 - 143*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*54*		*26 - 138*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,4,7,8-HxCDD	*55*		*32 - 141*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*26 - 152*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*28 - 130*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,6,7,8-HxCDF	*72*		*26 - 123*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,7,8,9-HxCDF	*64*		*29 - 147*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,7,8-PeCDD	*60*		*25 - 181*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-1,2,3,7,8-PeCDF	*60*		*24 - 185*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-2,3,4,6,7,8-HxCDF	*69*		*28 - 136*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-2,3,4,7,8-PeCDF	*58*		*21 - 178*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-2,3,7,8-TCDD	*66*		*25 - 164*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-2,3,7,8-TCDF	*64*		*24 - 169*	*09/04/18 09:00*	*09/07/18 19:27*	*1*
13C-OCDD	*46*		*17 - 157*	*09/04/18 09:00*	*09/07/18 19:27*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*128*		*35 - 197*	*09/04/18 09:00*	*09/07/18 19:27*	*1*

Client Sample ID: PDI-SG-B469
Date Collected: 07/02/18 16:30
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-3
Matrix: Solid
Percent Solids: 57.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.022	B	0.0043	0.00014	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,4,6,7,8-HpCDF	0.0049	q B	0.0043	0.00010	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,4,7,8,9-HpCDF	0.0011	J B	0.0043	0.00011	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,4,7,8-HxCDD	0.00047	J B	0.0043	0.000063	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,4,7,8-HxCDF	0.00055	J B	0.0043	0.000097	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0043	0.000066	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,6,7,8-HxCDF	0.00034	J q B	0.0043	0.000091	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,7,8,9-HxCDD	0.00097	J B	0.0043	0.000059	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,7,8,9-HxCDF	0.0023	J B	0.0043	0.000068	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,7,8-PeCDD	0.00022	J	0.0043	0.000062	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
1,2,3,7,8-PeCDF	0.00042	J B	0.0043	0.000054	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
2,3,4,6,7,8-HxCDF	0.00022	J	0.0043	0.000072	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
2,3,4,7,8-PeCDF	ND		0.0043	0.000057	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
2,3,7,8-TCDD	ND		0.00087	0.00013	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
2,3,7,8-TCDF	0.00034	J B	0.00087	0.000030	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
OCDD	0.20	B	0.0087	0.00012	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1
OCDF	0.018	B	0.0087	0.00011	ug/Kg	☼	09/04/18 09:00	09/07/18 20:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*39*		*28 - 143*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*47*		*26 - 138*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,4,7,8-HxCDD	*51*		*32 - 141*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,4,7,8-HxCDF	*55*		*26 - 152*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,7,8,9-HxCDF	*55*		*29 - 147*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,7,8-PeCDD	*48*		*25 - 181*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-1,2,3,7,8-PeCDF	*48*		*24 - 185*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-2,3,4,6,7,8-HxCDF	*58*		*28 - 136*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-2,3,4,7,8-PeCDF	*50*		*21 - 178*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-2,3,7,8-TCDD	*54*		*25 - 164*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-2,3,7,8-TCDF	*55*		*24 - 169*	*09/04/18 09:00*	*09/07/18 20:13*	*1*
13C-OCDD	*39*		*17 - 157*	*09/04/18 09:00*	*09/07/18 20:13*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*121*		*35 - 197*	*09/04/18 09:00*	*09/07/18 20:13*	*1*

Client Sample ID: PDI-SG-B456
Date Collected: 07/02/18 10:19
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-4
Matrix: Solid
Percent Solids: 58.5

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.033	B	0.0043	0.00021	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,4,6,7,8-HpCDF	0.0041	J B q	0.0043	0.000072	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,4,7,8,9-HpCDF	0.0011	J B	0.0043	0.000078	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,4,7,8-HxCDD	0.00044	J B	0.0043	0.000038	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,4,7,8-HxCDF	0.00052	J B	0.0043	0.000048	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0043	0.000038	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,6,7,8-HxCDF	0.00049	J B	0.0043	0.000048	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,7,8,9-HxCDD	0.00097	J B	0.0043	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,7,8,9-HxCDF	0.0027	J B	0.0043	0.000034	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,7,8-PeCDD	0.00022	J	0.0043	0.000041	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
1,2,3,7,8-PeCDF	0.00050	J B	0.0043	0.000040	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
2,3,4,6,7,8-HxCDF	0.00022	J	0.0043	0.000036	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
2,3,4,7,8-PeCDF	0.00018	J	0.0043	0.000042	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
2,3,7,8-TCDD	ND		0.00086	0.000060	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
2,3,7,8-TCDF	0.00028	J B	0.00086	0.000014	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
OCDD	0.35	B	0.0086	0.00013	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1
OCDF	0.013	B	0.0086	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 02:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*58*		*23 - 140*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*50*		*28 - 143*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*59*		*26 - 138*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,4,7,8-HxCDD	*49*		*32 - 141*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,4,7,8-HxCDF	*53*		*26 - 152*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,6,7,8-HxCDF	*53*		*26 - 123*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,7,8,9-HxCDF	*55*		*29 - 147*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,7,8-PeCDD	*48*		*25 - 181*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-1,2,3,7,8-PeCDF	*49*		*24 - 185*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-2,3,4,6,7,8-HxCDF	*55*		*28 - 136*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-2,3,4,7,8-PeCDF	*51*		*21 - 178*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-2,3,7,8-TCDD	*58*		*25 - 164*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-2,3,7,8-TCDF	*59*		*24 - 169*	*09/04/18 09:00*	*09/08/18 02:55*	*1*
13C-OCDD	*48*		*17 - 157*	*09/04/18 09:00*	*09/08/18 02:55*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*125*		*35 - 197*	*09/04/18 09:00*	*09/08/18 02:55*	*1*

Client Sample ID: PDI-SG-B462
Date Collected: 07/02/18 11:56
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-5
Matrix: Solid
Percent Solids: 54.1

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.028	B	0.0046	0.00016	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,4,6,7,8-HpCDF	0.0057	q B	0.0046	0.000082	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,4,7,8,9-HpCDF	0.0015	J B	0.0046	0.000086	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,4,7,8-HxCDD	0.00046	J B	0.0046	0.000031	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,4,7,8-HxCDF	0.00055	J B	0.0046	0.000051	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0046	0.000030	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,6,7,8-HxCDF	0.00043	J q B	0.0046	0.000052	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,7,8,9-HxCDD	0.0011	J B	0.0046	0.000028	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,7,8,9-HxCDF	0.0033	J B	0.0046	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,7,8-PeCDD	0.00024	J	0.0046	0.000041	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
1,2,3,7,8-PeCDF	0.00059	J B	0.0046	0.000039	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
2,3,4,6,7,8-HxCDF	0.00021	J	0.0046	0.000038	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
2,3,4,7,8-PeCDF	0.00017	J	0.0046	0.000041	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
2,3,7,8-TCDD	ND		0.00091	0.000079	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
2,3,7,8-TCDF	0.00029	J B	0.00091	0.000018	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
OCDD	0.25	B	0.0091	0.000099	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1
OCDF	0.026	B	0.0091	0.000045	ug/Kg	☼	09/04/18 09:00	09/08/18 03:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*46*		*23 - 140*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*39*		*28 - 143*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*49*		*26 - 138*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,4,7,8-HxCDD	*40*		*32 - 141*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,4,7,8-HxCDF	*44*		*26 - 152*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,6,7,8-HxCDD	*40*		*28 - 130*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,6,7,8-HxCDF	*42*		*26 - 123*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,7,8,9-HxCDF	*48*		*29 - 147*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,7,8-PeCDD	*42*		*25 - 181*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-1,2,3,7,8-PeCDF	*43*		*24 - 185*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-2,3,4,6,7,8-HxCDF	*46*		*28 - 136*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-2,3,4,7,8-PeCDF	*45*		*21 - 178*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-2,3,7,8-TCDD	*52*		*25 - 164*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-2,3,7,8-TCDF	*55*		*24 - 169*	*09/04/18 09:00*	*09/08/18 03:41*	*1*
13C-OCDD	*37*		*17 - 157*	*09/04/18 09:00*	*09/08/18 03:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*124*		*35 - 197*	*09/04/18 09:00*	*09/08/18 03:41*	*1*

Client Sample ID: PDI-SG-B463
Date Collected: 07/02/18 12:58
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-6
Matrix: Solid
Percent Solids: 60.2

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.018	B	0.0041	0.00010	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,4,6,7,8-HpCDF	0.0039	J B q	0.0041	0.000060	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,4,7,8,9-HpCDF	0.0011	J B	0.0041	0.000060	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,4,7,8-HxCDD	0.00035	J B	0.0041	0.000031	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,4,7,8-HxCDF	0.00055	J B	0.0041	0.000049	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,6,7,8-HxCDD	0.00092	J	0.0041	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,6,7,8-HxCDF	0.00037	J B	0.0041	0.000047	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,7,8,9-HxCDD	0.00089	J B	0.0041	0.000028	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,7,8,9-HxCDF	0.0028	J B	0.0041	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,7,8-PeCDD	0.00017	J	0.0041	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
1,2,3,7,8-PeCDF	0.00048	J B	0.0041	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
2,3,4,6,7,8-HxCDF	0.00015	J	0.0041	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
2,3,4,7,8-PeCDF	0.00015	J	0.0041	0.000032	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
2,3,7,8-TCDD	ND		0.00081	0.000093	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
2,3,7,8-TCDF	0.00022	J B	0.00081	0.000013	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
OCDD	0.17	B	0.0081	0.000072	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1
OCDF	0.012	B	0.0081	0.000033	ug/Kg	☼	09/04/18 09:00	09/08/18 04:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*23 - 140*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*47*		*28 - 143*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*58*		*26 - 138*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,4,7,8-HxCDD	*43*		*32 - 141*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,4,7,8-HxCDF	*46*		*26 - 152*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,6,7,8-HxCDD	*45*		*28 - 130*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,6,7,8-HxCDF	*46*		*26 - 123*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,7,8,9-HxCDF	*54*		*29 - 147*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,7,8-PeCDD	*47*		*25 - 181*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-1,2,3,7,8-PeCDF	*48*		*24 - 185*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-2,3,4,6,7,8-HxCDF	*51*		*28 - 136*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-2,3,4,7,8-PeCDF	*47*		*21 - 178*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-2,3,7,8-TCDD	*58*		*25 - 164*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-2,3,7,8-TCDF	*61*		*24 - 169*	*09/04/18 09:00*	*09/08/18 04:27*	*1*
13C-OCDD	*45*		*17 - 157*	*09/04/18 09:00*	*09/08/18 04:27*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*128*		*35 - 197*	*09/04/18 09:00*	*09/08/18 04:27*	*1*

Client Sample ID: PDI-SG-B464
Date Collected: 07/02/18 14:39
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-7
Matrix: Solid
Percent Solids: 49.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.027	B	0.0051	0.00016	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,4,6,7,8-HpCDF	0.0069	B q	0.0051	0.00015	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,4,7,8,9-HpCDF	0.0016	J B	0.0051	0.00016	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,4,7,8-HxCDD	0.00051	J B	0.0051	0.000036	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,4,7,8-HxCDF	0.00069	J B	0.0051	0.000072	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,6,7,8-HxCDD	0.0013	J	0.0051	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,6,7,8-HxCDF	0.00054	J B	0.0051	0.000073	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,7,8,9-HxCDD	0.0010	J B	0.0051	0.000032	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,7,8,9-HxCDF	0.0040	J B	0.0051	0.000047	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,7,8-PeCDD	0.00024	J	0.0051	0.000050	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
1,2,3,7,8-PeCDF	0.00079	J B	0.0051	0.000054	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
2,3,4,6,7,8-HxCDF	0.00023	J	0.0051	0.000053	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
2,3,4,7,8-PeCDF	0.00019	J	0.0051	0.000054	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
2,3,7,8-TCDD	ND		0.0010	0.00012	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
2,3,7,8-TCDF	0.00039	J B	0.0010	0.000026	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
OCDD	0.24	B	0.010	0.00012	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1
OCDF	0.035	B	0.010	0.000059	ug/Kg	☼	09/04/18 09:00	09/08/18 05:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*47*		*23 - 140*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*39*		*28 - 143*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*49*		*26 - 138*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,4,7,8-HxCDD	*42*		*32 - 141*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,4,7,8-HxCDF	*44*		*26 - 152*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,6,7,8-HxCDD	*42*		*28 - 130*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,6,7,8-HxCDF	*42*		*26 - 123*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,7,8,9-HxCDF	*49*		*29 - 147*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,7,8-PeCDD	*42*		*25 - 181*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-1,2,3,7,8-PeCDF	*43*		*24 - 185*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-2,3,4,6,7,8-HxCDF	*46*		*28 - 136*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-2,3,4,7,8-PeCDF	*45*		*21 - 178*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-2,3,7,8-TCDD	*51*		*25 - 164*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-2,3,7,8-TCDF	*54*		*24 - 169*	*09/04/18 09:00*	*09/08/18 05:13*	*1*
13C-OCDD	*37*		*17 - 157*	*09/04/18 09:00*	*09/08/18 05:13*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*126*		*35 - 197*	*09/04/18 09:00*	*09/08/18 05:13*	*1*

Client Sample ID: PDI-SG-B466
Date Collected: 07/02/18 15:34
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-8
Matrix: Solid
Percent Solids: 55.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.024	B	0.0046	0.00015	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,4,6,7,8-HpCDF	0.0043	J B q	0.0046	0.000064	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,4,7,8,9-HpCDF	0.00082	J B	0.0046	0.000067	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,4,7,8-HxCDD	0.00038	J B	0.0046	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,4,7,8-HxCDF	0.00051	J B	0.0046	0.000041	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0046	0.000028	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,6,7,8-HxCDF	0.00033	J B	0.0046	0.000040	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,7,8,9-HxCDD	0.00099	J B	0.0046	0.000026	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,7,8,9-HxCDF	0.0018	J B	0.0046	0.000025	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,7,8-PeCDD	0.00020	J	0.0046	0.000036	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
1,2,3,7,8-PeCDF	0.00040	J B	0.0046	0.000031	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
2,3,4,6,7,8-HxCDF	0.00016	J	0.0046	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
2,3,4,7,8-PeCDF	0.00016	J	0.0046	0.000036	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
2,3,7,8-TCDD	ND		0.00091	0.00011	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
2,3,7,8-TCDF	0.00027	J B	0.00091	0.000017	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
OCDD	0.20	B	0.0091	0.000079	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1
OCDF	0.013	B	0.0091	0.000027	ug/Kg	☼	09/04/18 09:00	09/08/18 05:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*65*		*23 - 140*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*55*		*28 - 143*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*65*		*26 - 138*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,4,7,8-HxCDD	*47*		*32 - 141*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,4,7,8-HxCDF	*51*		*26 - 152*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,6,7,8-HxCDF	*51*		*26 - 123*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,7,8,9-HxCDF	*59*		*29 - 147*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,7,8-PeCDD	*50*		*25 - 181*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-1,2,3,7,8-PeCDF	*50*		*24 - 185*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-2,3,4,6,7,8-HxCDF	*57*		*28 - 136*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-2,3,4,7,8-PeCDF	*47*		*21 - 178*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-2,3,7,8-TCDF	*56*		*24 - 169*	*09/04/18 09:00*	*09/08/18 05:59*	*1*
13C-OCDD	*56*		*17 - 157*	*09/04/18 09:00*	*09/08/18 05:59*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*124*		*35 - 197*	*09/04/18 09:00*	*09/08/18 05:59*	*1*

Client Sample ID: PDI-SG-B468
Date Collected: 07/02/18 16:33
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-9
Matrix: Solid
Percent Solids: 61.9

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.0088	B	0.0040	0.000063	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,4,6,7,8-HpCDF	0.0020	J B q	0.0040	0.000055	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,4,7,8,9-HpCDF	0.00093	J B q	0.0040	0.000052	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,4,7,8-HxCDD	ND		0.0040	0.000023	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,4,7,8-HxCDF	0.00023	J B	0.0040	0.000051	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,6,7,8-HxCDD	0.00055	J	0.0040	0.000023	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,6,7,8-HxCDF	0.00021	J B q	0.0040	0.000053	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,7,8,9-HxCDD	0.00052	J B	0.0040	0.000021	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,7,8,9-HxCDF	0.0026	J B	0.0040	0.000034	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,7,8-PeCDD	0.00011	J	0.0040	0.000028	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
1,2,3,7,8-PeCDF	0.00044	J B	0.0040	0.000031	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
2,3,4,6,7,8-HxCDF	ND		0.0040	0.000039	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
2,3,4,7,8-PeCDF	0.000078	J	0.0040	0.000032	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
2,3,7,8-TCDD	ND		0.00081	0.000061	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
2,3,7,8-TCDF	0.00013	J B	0.00081	0.000012	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
OCDD	0.081	B	0.0081	0.000057	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1
OCDF	0.0068	J B	0.0081	0.000045	ug/Kg	☼	09/04/18 09:00	09/08/18 06:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*36*		*28 - 143*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*49*		*26 - 138*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,4,7,8-HxCDD	*40*		*32 - 141*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,4,7,8-HxCDF	*44*		*26 - 152*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,6,7,8-HxCDD	*39*		*28 - 130*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,6,7,8-HxCDF	*41*		*26 - 123*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,7,8,9-HxCDF	*49*		*29 - 147*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,7,8-PeCDD	*42*		*25 - 181*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-1,2,3,7,8-PeCDF	*43*		*24 - 185*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-2,3,4,6,7,8-HxCDF	*45*		*28 - 136*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-2,3,4,7,8-PeCDF	*46*		*21 - 178*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-2,3,7,8-TCDD	*55*		*25 - 164*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-2,3,7,8-TCDF	*59*		*24 - 169*	*09/04/18 09:00*	*09/08/18 06:45*	*1*
13C-OCDD	*33*		*17 - 157*	*09/04/18 09:00*	*09/08/18 06:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*126*		*35 - 197*	*09/04/18 09:00*	*09/08/18 06:45*	*1*

Client Sample ID: PDI-SG-B429
Date Collected: 07/03/18 10:15
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-10
Matrix: Solid
Percent Solids: 57.4

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.024	B	0.0043	0.00013	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,4,6,7,8-HpCDF	0.0052	q B	0.0043	0.000096	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,4,7,8,9-HpCDF	0.00060	J B	0.0043	0.00010	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,4,7,8-HxCDD	0.00042	J B	0.0043	0.000023	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,4,7,8-HxCDF	0.00081	J B	0.0043	0.000046	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0043	0.000022	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,6,7,8-HxCDF	0.00050	J B	0.0043	0.000043	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,7,8,9-HxCDD	0.00096	J B	0.0043	0.000021	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,7,8,9-HxCDF	0.0012	J B	0.0043	0.000030	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,7,8-PeCDD	0.00025	J	0.0043	0.000029	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
1,2,3,7,8-PeCDF	0.00068	J B	0.0043	0.000037	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
2,3,4,6,7,8-HxCDF	0.00031	J	0.0043	0.000035	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
2,3,4,7,8-PeCDF	0.00076	J	0.0043	0.000041	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
2,3,7,8-TCDD	0.00011	J q	0.00087	0.000026	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
OCDD	0.23	B	0.0087	0.00011	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1
OCDF	0.017	B	0.0087	0.000027	ug/Kg	☼	09/04/18 09:00	09/08/18 07:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*79*		*23 - 140*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*66*		*28 - 143*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*78*		*26 - 138*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,4,7,8-HxCDD	*59*		*32 - 141*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,4,7,8-HxCDF	*64*		*26 - 152*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,6,7,8-HxCDD	*62*		*28 - 130*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,6,7,8-HxCDF	*66*		*26 - 123*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,7,8,9-HxCDF	*69*		*29 - 147*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,7,8-PeCDD	*57*		*25 - 181*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-1,2,3,7,8-PeCDF	*58*		*24 - 185*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-2,3,4,6,7,8-HxCDF	*67*		*28 - 136*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-2,3,4,7,8-PeCDF	*56*		*21 - 178*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*09/04/18 09:00*	*09/08/18 07:31*	*1*
13C-OCDD	*67*		*17 - 157*	*09/04/18 09:00*	*09/08/18 07:31*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*125*		*35 - 197*	*09/04/18 09:00*	*09/08/18 07:31*	*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	ND		0.00087	0.000047	ug/Kg	☼	09/04/18 09:00	09/10/18 23:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*89*		*24 - 169*	*09/04/18 09:00*	*09/10/18 23:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*118*		*35 - 197*	*09/04/18 09:00*	*09/10/18 23:23*	*1*

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

Lab Sample ID: MB 320-243668/1-A
Matrix: Solid
Analysis Batch: 244513

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 243668

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.0000959	J q	0.0050	0.000019	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,4,6,7,8-HpCDF	0.0000768	J q	0.0050	0.000016	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,4,7,8,9-HpCDF	0.000310	J	0.0050	0.000018	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,4,7,8-HxCDD	0.000159	J	0.0050	0.000014	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,4,7,8-HxCDF	0.0000528	J	0.0050	0.000027	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000014	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,6,7,8-HxCDF	0.0000606	J	0.0050	0.000026	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,7,8,9-HxCDD	0.0000441	J q	0.0050	0.000013	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,7,8,9-HxCDF	0.000917	J	0.0050	0.000019	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000023	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
1,2,3,7,8-PeCDF	0.000169	J	0.0050	0.000021	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000021	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000024	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
2,3,7,8-TCDD	ND		0.0010	0.000028	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
2,3,7,8-TCDF	0.0000573	J q	0.0010	0.000011	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
OCDD	0.000744	J	0.010	0.000017	ug/Kg		09/04/18 09:00	09/08/18 00:37	1
OCDF	0.000163	J	0.010	0.000018	ug/Kg		09/04/18 09:00	09/08/18 00:37	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*88*		*23 - 140*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*83*		*28 - 143*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*86*		*26 - 138*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,4,7,8-HxCDD	*68*		*32 - 141*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,4,7,8-HxCDF	*76*		*26 - 152*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,6,7,8-HxCDD	*71*		*28 - 130*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,6,7,8-HxCDF	*78*		*26 - 123*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,7,8,9-HxCDF	*76*		*29 - 147*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,7,8-PeCDD	*64*		*25 - 181*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-2,3,4,6,7,8-HxCDF	*77*		*28 - 136*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-2,3,4,7,8-PeCDF	*63*		*21 - 178*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-2,3,7,8-TCDD	*73*		*25 - 164*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-2,3,7,8-TCDF	*69*		*24 - 169*	*09/04/18 09:00*	*09/08/18 00:37*	*1*
13C-OCDD	*80*		*17 - 157*	*09/04/18 09:00*	*09/08/18 00:37*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*123*		*35 - 197*	*09/04/18 09:00*	*09/08/18 00:37*	*1*

Lab Sample ID: LCS 320-243668/2-A
Matrix: Solid
Analysis Batch: 244513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 243668

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.0998		ug/Kg		100	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.108		ug/Kg		108	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.109		ug/Kg		109	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.109		ug/Kg		109	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.110		ug/Kg		110	72 - 134

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

Lab Sample ID: LCS 320-243668/2-A
Matrix: Solid
Analysis Batch: 244513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 243668

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.109		ug/Kg		109	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.109		ug/Kg		109	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.116		ug/Kg		116	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.110		ug/Kg		110	78 - 130
1,2,3,7,8-PeCDD	0.100	0.102		ug/Kg		102	70 - 142
1,2,3,7,8-PeCDF	0.100	0.108		ug/Kg		108	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.111		ug/Kg		111	70 - 156
2,3,4,7,8-PeCDF	0.100	0.108		ug/Kg		108	68 - 160
2,3,7,8-TCDD	0.0200	0.0191		ug/Kg		96	67 - 158
2,3,7,8-TCDF	0.0200	0.0214		ug/Kg		107	75 - 158
OCDD	0.200	0.201		ug/Kg		100	78 - 144
OCDF	0.200	0.229		ug/Kg		114	63 - 170

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*88*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*82*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*87*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*66*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*74*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*71*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*75*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*77*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*66*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*66*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*77*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*63*		*13 - 328*
13C-2,3,7,8-TCDD	*72*		*20 - 175*
13C-2,3,7,8-TCDF	*70*		*22 - 152*
13C-OCDD	*80*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*124*		*31 - 191*

Lab Sample ID: LCSD 320-243668/3-A
Matrix: Solid
Analysis Batch: 244513

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 243668

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.0967		ug/Kg		97	70 - 140	3	50
1,2,3,4,6,7,8-HpCDF	0.100	0.102		ug/Kg		102	82 - 122	6	50
1,2,3,4,7,8,9-HpCDF	0.100	0.105		ug/Kg		105	78 - 138	4	50
1,2,3,4,7,8-HxCDD	0.100	0.104		ug/Kg		104	70 - 164	5	50
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134	4	50
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134	5	50
1,2,3,6,7,8-HxCDF	0.100	0.105		ug/Kg		105	84 - 130	3	50
1,2,3,7,8,9-HxCDD	0.100	0.117		ug/Kg		117	64 - 162	0	50
1,2,3,7,8,9-HxCDF	0.100	0.107		ug/Kg		107	78 - 130	3	50
1,2,3,7,8-PeCDD	0.100	0.0992		ug/Kg		99	70 - 142	3	50

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

Lab Sample ID: LCSD 320-243668/3-A
Matrix: Solid
Analysis Batch: 244513

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 243668

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.105		ug/Kg		105	80 - 134	3	50
2,3,4,6,7,8-HxCDF			0.100	0.107		ug/Kg		107	70 - 156	4	50
2,3,4,7,8-PeCDF			0.100	0.104		ug/Kg		104	68 - 160	4	50
2,3,7,8-TCDD			0.0200	0.0183		ug/Kg		91	67 - 158	4	50
2,3,7,8-TCDF			0.0200	0.0208		ug/Kg		104	75 - 158	3	50
OCDD			0.200	0.196		ug/Kg		98	78 - 144	2	50
OCDF			0.200	0.223		ug/Kg		112	63 - 170	2	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*88*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*81*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*88*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*65*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*70*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*70*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*71*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*77*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*67*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*67*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*76*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*63*		*13 - 328*
13C-2,3,7,8-TCDD	*74*		*20 - 175*
13C-2,3,7,8-TCDF	*71*		*22 - 152*
13C-OCDD	*80*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*125*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-78604-8

Client Sample ID: PDI-SG-B458
Date Collected: 07/02/18 11:00
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-1
Matrix: Solid
Percent Solids: 57.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244511	09/07/18 18:41	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	245034	09/10/18 22:45	AS	TAL SAC

Client Sample ID: PDI-SG-B470
Date Collected: 07/02/18 15:20
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-2
Matrix: Solid
Percent Solids: 58.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244511	09/07/18 19:27	ALM	TAL SAC

Client Sample ID: PDI-SG-B469
Date Collected: 07/02/18 16:30
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-3
Matrix: Solid
Percent Solids: 57.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244511	09/07/18 20:13	ALM	TAL SAC

Client Sample ID: PDI-SG-B456
Date Collected: 07/02/18 10:19
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-4
Matrix: Solid
Percent Solids: 58.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 02:55	AS	TAL SAC

Client Sample ID: PDI-SG-B462
Date Collected: 07/02/18 11:56
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-5
Matrix: Solid
Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 03:41	AS	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-78604-8

Client Sample ID: PDI-SG-B463
Lab Sample ID: 580-78604-6
Date Collected: 07/02/18 12:58
Matrix: Solid
Date Received: 07/05/18 14:59
Percent Solids: 60.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 04:27	AS	TAL SAC

Client Sample ID: PDI-SG-B464
Lab Sample ID: 580-78604-7
Date Collected: 07/02/18 14:39
Matrix: Solid
Date Received: 07/05/18 14:59
Percent Solids: 49.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 05:13	AS	TAL SAC

Client Sample ID: PDI-SG-B466
Lab Sample ID: 580-78604-8
Date Collected: 07/02/18 15:34
Matrix: Solid
Date Received: 07/05/18 14:59
Percent Solids: 55.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 05:59	AS	TAL SAC

Client Sample ID: PDI-SG-B468
Lab Sample ID: 580-78604-9
Date Collected: 07/02/18 16:33
Matrix: Solid
Date Received: 07/05/18 14:59
Percent Solids: 61.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 06:45	AS	TAL SAC

Client Sample ID: PDI-SG-B429
Lab Sample ID: 580-78604-10
Date Collected: 07/03/18 10:15
Matrix: Solid
Date Received: 07/05/18 14:59
Percent Solids: 57.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	244513	09/08/18 07:31	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		243668	09/04/18 09:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	245034	09/10/18 23:23	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: 580-78604-8
Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Laboratory: TestAmerica Sacramento

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

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

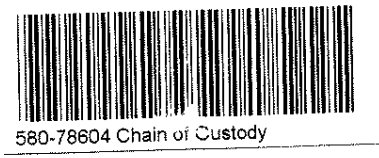
Sample Summary

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

TestAmerica Job ID: 580-78604-8

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78604-1	PDI-SG-B458	Solid	07/02/18 11:00	07/05/18 14:59
580-78604-2	PDI-SG-B470	Solid	07/02/18 15:20	07/05/18 14:59
580-78604-3	PDI-SG-B469	Solid	07/02/18 16:30	07/05/18 14:59
580-78604-4	PDI-SG-B456	Solid	07/02/18 10:19	07/05/18 14:59
580-78604-5	PDI-SG-B462	Solid	07/02/18 11:56	07/05/18 14:59
580-78604-6	PDI-SG-B463	Solid	07/02/18 12:58	07/05/18 14:59
580-78604-7	PDI-SG-B464	Solid	07/02/18 14:39	07/05/18 14:59
580-78604-8	PDI-SG-B466	Solid	07/02/18 15:34	07/05/18 14:59
580-78604-9	PDI-SG-B468	Solid	07/02/18 16:33	07/05/18 14:59
580-78604-10	PDI-SG-B429	Solid	07/03/18 10:15	07/05/18 14:59

580-78604



SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010** **Analysis Turnaround Time** Calendar (C) or Work Days (W)	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**7/5/2018** **Carrier: Courier**	COC No: 1 1 of 1 pages
Client Contact AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: **Surface Sediment** Sample Type: **D/U**	☐ 21 days ☒ Other _ASAP_(sediments only)_____			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury, NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Krone/Unger	Atterberg Limits ASTM D4318	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	WQ - Total Organic Carbon SM5310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LL	WQ - Tributyltin Krone/Unger		Sample Specific Notes:
PDI-SG-B458	7/2/2018	11:00	SS		AC	7		H	H	H	x	H	H	H										
PDI-SG-B470	7/2/2018	15:20	SS		AC	B		H	H	H	x	H	H	H	H									
PDI-SG-B469	7/2/2018	16:30	SS		AC	B		H	H	H	x	H	H	H	H									
PDI-SG-B456	7/2/2018	10:19	SS		SH	7		H	H	H	x	H	H	H										
PDI-SG-B462	7/2/2018	11:56	SS		SH	B		H	H	H	x	H	H	H	H									
PDI-SG-B463	7/2/2018	12:58	SS	MS/MSD	SH	14		H	H	H	x	H	H	H	H									
PDI-SG-B464	7/2/2018	14:39	SS		SH	8		H	H	H	x	H	H	H	H									
PDI-SG-B466	7/2/2018	15:34	SS		SH	8		H	H	x*	x*	x*	H	H	H									
PDI-SG-B468	7/2/2018	14:02 16:35	SS		SH	8		H	H	H	x	H	H	H	H									
PDI-SG-B429	7/3/2018	10:15	SS		SH	7		H	H	H	x	H	H	H										
RB-VV-180703-1720	7/3/2018	17:20	W		SH	14										x	x	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 ☒ Disposal By Lab ☒ Archive For **12** Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab.

x*- Analyze for grain size, metals (6020B analytes only), and TOC (9060 @ 104C & 70C) ASAP. Rush TAT for these take precedent over remaining rush grain size analyses requested ASAP.

H - Hold analyses pending further instruction.

0.7, 2.2, 0.3

Relinquished by:	Company: AECOM	Date/Time: 7/5/18 1234	Received by:	Company: M.E.	Date/Time: 7/5/18 1235
Relinquished by:	Company: M.E.	Date/Time: 7/5/18 1500	Received by:	Company: TAPOR	Date/Time: 7/5/18 1500
Relinquished by:	Company: TAPOR	Date/Time: 7/5/18 1700	Received by:	Company: SFAT	Date/Time: 7/6/18 0930

= 0.8 / 0.8 w/cs

IRS = 0.7 / 0.7 w/cs.

= -1.9 / -1.9 w/cs

Revised COC

580-78604

580-78604 Chain of Custody

SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047	Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) ☐ 21 days ☒ Other _ASAP_(sediments only)_____	Site Contact: Jennifer Ray Laboratory Contact: Elaine-Walker	7/5/2018 Carrier: Courier	COC No: 1 1 of 1 pages

Client Contact: AECOM, 1111 3rd Ave Suite 1600, Seattle, WA 98101, Phone: (206) 438-2700 Fax: 1+(866) 495-5288
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Portland, OR
Project #: 60566335 Study: Surface Sediment
Sample Type: D/U

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D4913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -30 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kreosl/Unger	Atterberg Limits ASTM D4318	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	WQ - Total Organic Carbon SM5310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LL	WQ - Tributyltin Kreosl/Unger	Sample Specific Notes:
PDI-SG-B458	7/2/2018	11:00	SS		AC	7	H	H	H	x	H	H	H									
PDI-SG-B470	7/2/2018	15:20	SS		AC	B	H	H	H	x	H	H	H	H								
PDI-SG-B469	7/2/2018	16:30	SS		AC	B	H	H	H	x	H	H	H	H								
PDI-SG-B456	7/2/2018	10:19	SS		SH	7	H	H	H	x	H	H	H									
PDI-SG-B462	7/2/2018	11:56	SS		SH	B	H	H	H	x	H	H	H	H								
PDI-SG-B463	7/2/2018	12:58	SS	MS/MSD	SH	14	H	H	H	x	H	H	H	H								
PDI-SG-B464	7/2/2018	14:39	SS		SH	8	H	H	H	x	H	H	H	H								
PDI-SG-B466	7/2/2018	15:34	SS		SH	8	H	H	x*	x*	x*	H	H	H								
PDI-SG-B468	7/2/2018	14:02/16:33	SS		SH	8	H	H	H	x	H	H	H	H								
PDI-SG-B429	7/3/2018	10:15	SS		SH	7	H	H	HX	x	X	X	H									
FDI-RB-VV-180703-1720 (KP 7/22/18 Per Amec)	7/3/2018	17:20	W		SH	14									x	x	x	x	x	x	x	***Added analysis 7/19 (KP) Per Amec

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

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

Special Instructions/QC Requirements & Comments:
Separate reports for each lab.
x*- Analyze for grain size, metals (6020B analytes only), and TOC (9060 @ 104C & 70C) ASAP. Rush TAT for these take precedent over remaining rush grain size analyses requested ASAP.
H - Hold analyses pending further instruction.

0.7, 2.2, 0.3

Relinquished by:	Company: AECOM	Date/Time: 7/5/18 1234	Received by:	Company: M.E.	Date/Time: 7/5/18 1235
Relinquished by:	Company: M.E.	Date/Time: 7/5/18 1500	Received by:	Company: TAPOR	Date/Time: 7/5/18 1500
Relinquished by:	Company: TAPOR	Date/Time: 7/5/18 1700	Received by: B.	Company: SFR TA	Date/Time: 7/6/18 0930

*** Metals, TOC, Solids activated
In On Hold Samples Per Amec
7/19/18 (KP)

*** Revised ~~Corrected~~ Changed Sample Id Add PDI-RB-VV-180703-1720 Remove -1720 (KP) Per Amec 7/22/18

= 0.8 / 0.8 w/cs
IRS = 0.7 / 0.7 w/cs.
= -1.9 / -1.9 w/cs

9/19/2018

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: 580-56927.1
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 #: 580-78604-1
Address: 880 Riverside Parkway, .	Due Date Requested: 7/23/2018			
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 (MOD) Full List w/o Totals	AutoOP/ PH Frozen Archive Container billed @ $0.	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
PDI-SG-B458 (580-78604-1)	7/2/18	11:00 Pacific		Solid			X	X		2	
PDI-SG-B470 (580-78604-2)	7/2/18	15:20 Pacific		Solid			X	X		2	
PDI-SG-B469 (580-78604-3)	7/2/18	16:30 Pacific		Solid			X	X		2	
PDI-SG-B456 (580-78604-4)	7/2/18	10:19 Pacific		Solid			X	X		2	
PDI-SG-B462 (580-78604-5)	7/2/18	11:56 Pacific		Solid			X	X		2	
PDI-SG-B463 (580-78604-6)	7/2/18	12:58 Pacific		Solid			X	X		2	
PDI-SG-B464 (580-78604-7)	7/2/18	14:39 Pacific		Solid			X	X		2	
PDI-SG-B466 (580-78604-8)	7/2/18	15:34 Pacific		Solid			X	X		2	
PDI-SG-B468 (580-78604-9)	7/2/18	16:33 Pacific		Solid			X	X		2	

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

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

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	7/6/18	TAOR	[signature]	7-7-18 905	[signature]
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.3

Ver: 09/20/2016

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-56927.2
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 #: 580-78604-1
Address: 880 Riverside Parkway,	Due Date Requested: 7/23/2018			
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

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	AutoOP/ PH Frozen Archive Container billed @ $0.	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
PDI-SG-B429 (580-78604-10)	7/3/18	10:15 Pacific		Solid			X	X		2	
RB-VV-180703-1720 (580-78604-11)	7/3/18	17:20 Pacific		Water					X	2	

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:

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:	7/6/18 1700	TAOR		7-7-18 905	TA SRC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.3

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78604-8

Login Number: 78604
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: 580-78604-8

Login Number: 78604
List Number: 5
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento
List Creation: 07/07/18 05:08 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	4.3
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	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78604-8

Login Number: 78604
List Number: 6
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento
List Creation: 07/07/18 05:10 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	4.3
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	

Isotope Dilution Summary

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

TestAmerica Job ID: 580-78604-8

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-78604-1	PDI-SG-B458	43	35	42	53	61	55	67	58
580-78604-1 - RA	PDI-SG-B458								
580-78604-2	PDI-SG-B470	53	43	54	55	65	61	72	64
580-78604-3	PDI-SG-B469	45	39	47	51	55	50	58	55
580-78604-4	PDI-SG-B456	58	50	59	49	53	50	53	55
580-78604-5	PDI-SG-B462	46	39	49	40	44	40	42	48
580-78604-6	PDI-SG-B463	56	47	58	43	46	45	46	54
580-78604-7	PDI-SG-B464	47	39	49	42	44	42	42	49
580-78604-8	PDI-SG-B466	65	55	65	47	51	50	51	59
580-78604-9	PDI-SG-B468	45	36	49	40	44	39	41	49
580-78604-10	PDI-SG-B429	79	66	78	59	64	62	66	69
580-78604-10 - RA	PDI-SG-B429								
MB 320-243668/1-A	Method Blank	88	83	86	68	76	71	78	76

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-78604-1	PDI-SG-B458	61	59	68	58	68		40
580-78604-1 - RA	PDI-SG-B458						89	
580-78604-2	PDI-SG-B470	60	60	69	58	66	64	46
580-78604-3	PDI-SG-B469	48	48	58	50	54	55	39
580-78604-4	PDI-SG-B456	48	49	55	51	58	59	48
580-78604-5	PDI-SG-B462	42	43	46	45	52	55	37
580-78604-6	PDI-SG-B463	47	48	51	47	58	61	45
580-78604-7	PDI-SG-B464	42	43	46	45	51	54	37
580-78604-8	PDI-SG-B466	50	50	57	47	57	56	56
580-78604-9	PDI-SG-B468	42	43	45	46	55	59	33
580-78604-10	PDI-SG-B429	57	58	67	56	64		67
580-78604-10 - RA	PDI-SG-B429						89	
MB 320-243668/1-A	Method Blank	64	65	77	63	73	69	80

Surrogate Legend

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-78604-8

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-243668/2-A	Lab Control Sample	88	82	87	66	74	71	75	77
LCSD 320-243668/3-A	Lab Control Sample Dup	88	81	88	65	70	70	71	77

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)	
LCS 320-243668/2-A	Lab Control Sample	66	66	77	63	72	70	80	
LCSD 320-243668/3-A	Lab Control Sample Dup	67	67	76	63	74	71	80	

Surrogate Legend

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